

## Introduction

- There are several options in the treatment of cesarean scar pregnancies (CSP). However, it is not well known that the strength and weakness of respective treatment options for CSP.
- The aim of this study was to compare the efficacy and complications of ultrasound-guided local injection of methotrexate (MTX) and dilatation and evacuation (D&E) used in the treatment of CSP.

## Materials & Methods

The design of this study was prospective, observational study. Twenty four patients were diagnosed with CSP at Ajou University Hospital between June 2015 and December 2021. Among them, 2 patients were excluded because they had received primary treatment at other hospitals. Twelve received 25mg local MTX injection under ultrasound guidance, and 10 were treated with D&E. The serum beta-human chorionic gonadotropin ( $\beta$ -hCG) was measured serially after the treatment. The success group was defined as a decrease in  $\beta$ -hCG level with/without an increase within two weeks after the therapy. The failure group was defined as increased  $\beta$ -hCG level after a downward trend in two weeks or when other treatment modalities were required.

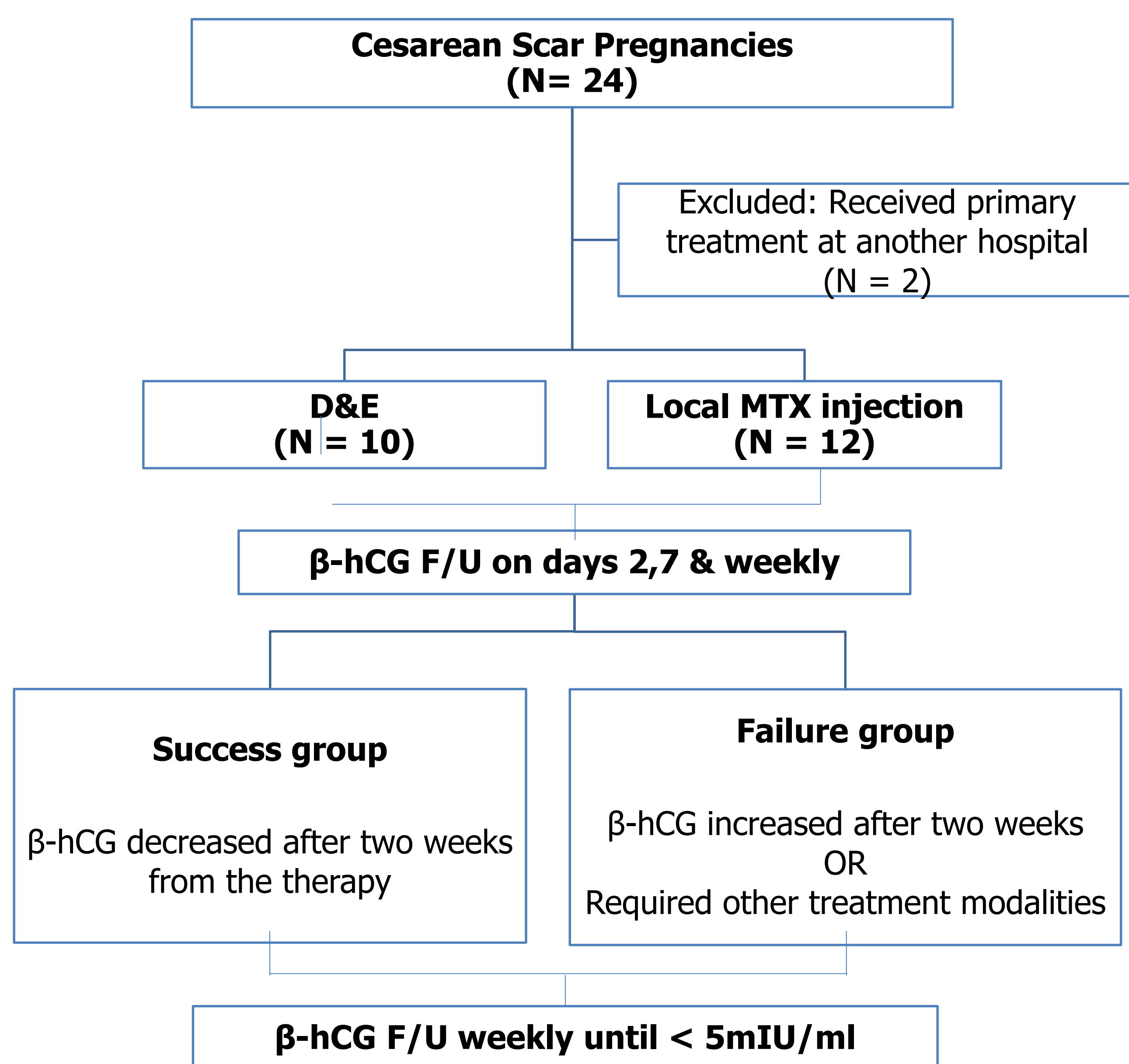


Figure 1. Flow diagram of the study

Table 1. Baseline characteristics of the patients

	Local MTX (n=12)	D&E (n=10)	p-value
<b>Age</b> (years)	37.5 ± 3.7	36.0 ± 4.5	0.405
<b>Gravidity</b>			0.125
2 (n, %)	0 (0)	1 (10)	
3 (n, %)	2 (17)	5 (50)	
4 (n, %)	3 (25)	0 (0)	
≥5 (n, %)	7 (58)	4 (40)	
<b>Parity</b>			0.624
1 (n, %)	1 (8)	3 (30)	
2 (n, %)	6 (50)	4 (40)	
≥3 (n, %)	5 (42)	3 (30)	
<b>Previous c/sec number</b>			0.453
1 (n, %)	1 (8)	3 (30)	
2 (n, %)	7 (58)	4 (40)	
3 (n, %)	4 (33)	3 (30)	
<b>MGD</b> (mm)	31.0 ± 19.5	31.5 ± 13.3	0.947
<b>Initial <math>\beta</math>-hCG</b> (mIU/dl)	74474.8 ± 82079.2	57581.4 ± 39966.4	0.821
<b>Time to reach normal <math>\beta</math>-hCG levels</b> (days)	74.6 ± 43.7	42.8 ± 39.3	<b>0.036</b>

C/Sec, cesarean section; MGD, Mean Gestational sac Diameter;

## Results

There were no significant differences in maternal age, gravida, parity, number of previous cesarean sections, mean gestational sac diameter, and initial  $\beta$ -hCG level among 12 patients in the local MTX-treated group and 10 patients in the D&E group. However, the time to normalize  $\beta$ -hCG was different between the groups (74.6 ± 43.7 vs. 42.8 ± 39.3 days, p=0.036) (Table 1). The success rate was 25% in the MTX group and 90% in the D&E group, showing a significant difference in Fisher's test. In the ultrasound-guided MTX intra-gestational injection group, treatment was unsuccessful in 9 out of 12 patients, 7 out of 9 (78%) required other treatment modalities, and 2 out of 9 (22%) patients, the  $\beta$ -hCG level increased even after two weeks after treatment. In case of failure after local MTX treatment, two patients (22%) received systematic MTX treatment, and seven patients (78%) underwent D&E interventions (Table 2).

Table 2. Comparison of success rates and 2<sup>nd</sup> treatment option of local MTX injection versus D&E

	Local MTX (n=12)	D&E (n=10)	p-value
<b>Success group</b> (n, %)	3 (25)	9 (90)	<b>0.004</b>
<b>Failure group</b> (n, %)	9 (75)	1 (10)	<b>0.004</b>
Required other treatment (n, %)	7 (78)	1 (100)	
$\beta$ -hCG increased after 2 weeks from Tx (n, %)	2 (22)	0 (0)	
<b>2<sup>nd</sup> treatment option:</b>			
Sono-guided local MTX injection (n, %)	0 (0)	1 (100)	
Systematic MTX injection (n, %)	2 (22)	0 (0)	
D&E (n, %)	7 (78)	0 (0)	

D&E, dilatation and evacuation; MTX; methotrexate; Tx; Treatment

Table 3 shows complications according to treatment methods. Among the 10 cases of D&E, prophylactic uterine artery embolization accounted for 40% of patients with increased vascularity, and there was one case that re-UAE was performed due to bleeding even after prophylactic UAE. Postoperative vaginal bleeding or abdominal pain side effects complained, but there were no cases of severe side effects in both methods groups. Table 4 shows the difference in hemoglobin(Hb) levels before and after the procedure. Significantly, the Hb reduction was more significant in the D&E group (1.1 ± 0.9 vs. 2.1 ± 0.7 p=0.009). In other words, it suggests that there was more bleeding after D&E than local MTX injection, even though UAE was performed in advance.

Table 3. Complications of CSP patients according to therapeutic modalities

	Local MTX (n=12)	D&E (n=10)
Prophylactic UAE	0	4
Post procedure UAE	2	1
Transfusion	1 (pRBC 2)	1 (pRBC 2)
Severe vaginal bleeding after treatment	3	6
Severe abdominal pain after treatment	0	1
Perforation of uterine	0	0

D&E, dilatation and evaculatoin; MTX; methotrexate; pRBC, Packed Red Blood Cell; UAE, Uterine artery embolization;

Table 4. Comparisons of decreased hemoglobin levels according to therapeutic modalities

	Local MTX (n=12)	D&E (n=10)	p-value
Difference of Hb level before and after treatment (g/dL)	1.1 ± 0.9	2.1 ± 0.7	<b>0.009</b>

D&E, dilatation and evacuation; Hb, hemoglobin; MTX; methotrexate;

## Discussion & Conclusion

- The D&E showed better efficacy compare to local MTX injection in our analysis. ( $\beta$ -hCG level was normalized more quickly, and the success rate was higher) However, it should be performed under the infrastructure, such as the UAE, because there is an increased risk of bleeding.
- Local MTX injection, even though the amount of bleeding was smaller, had more chance to need additional treatment, such as D&E. Furthermore, it required more time to reach normal  $\beta$ -hCG levels.