

Retrospective study on the effects of caesarean niche on IVF outcomes

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	LSCS	NVD	p value
Number of subjects	n = 196	n = 223	
	Mean ± SD		
Age	37.1 ± 2.74	35.8 ± 2.98	< 0.0005 (Independent t-test)
BMI	24.6 ± 5.01	23.4 ± 4.24	0.009 (Independent t -test)
Race			0.911 (chi-square test)
Chinese	143 (73.0%)	165 (74.0%)	
Indian	14 (7.1%)	14 (6.3%)	
Malay	24 (12.2%)	30 (13.5%)	
Others	15 (7.7%)	14 (6.3%)	
Parity			0.530 (chi-square test)
1	186 (95.4%)	211 (94.2%)	
2	9 (4.6%)	12 (5.4%)	
3	1 (0.5%)	0 (0.0%)	
Types of Embryo Transfer			0.425 (chi-square test)
Cleavage	64 (34.0%)	67 (30.0%)	
Blastocyst	125 (66.1%)	155 (69.8%)	
Number of Embryos Transferred			0.947 (chi-square test)
0	45 (23.1%)	51 (22.8%)	
1	94 (48.0%)	104 (46.6%)	
2	57 (29.2%)	68 (30.4%)	
Types of ART			0.131 (chi-square test)
ICSI	188 (95.9%)	210 (94.2%)	
IVF	2 (1.0%)	0 (0.0%)	
ICSI/IVF	6 (3.1%)	13 (5.8%)	
Number of LSCS previously			< 0.0005 (chi-square test)
1	189 (96.4%)	0 (0.0%)	
2	7 (3.6%)	0 (0.0%)	
Infertility Factor			
Adenomyosis	0 (0.0%)	1 (0.5%)	0.348 (chi-square test)
Tubal Obstruction	36 (18.4%)	31 (13.9%)	0.213 (chi-square test)
Maternal Age ≥ 40 years old	8 (4.1%)	5 (2.2%)	0.279 (chi-square test)
Diminished Ovarian Reserve	19 (9.7%)	22 (9.8%)	0.953 (chi-square test)
Endometriosis	20 (10.3%)	6 (2.7%)	0.001 (chi-square test)
Idiopathic Subfertility	47 (24.1%)	50 (22.3%)	0.706 (chi-square test)
Male Factor	42 (21.5%)	70 (31.3%)	0.022 (chi-square test)
Ovulatory Disorder	24 (12.3%)	38 (17.0%)	0.168 (chi-square test)
PGD Case	2 (1.0%)	1 (0.5%)	0.488 (chi-square test)
Vaginismus	0 (0.0%)	1 (0.5%)	0.348 (chi-square test)

Table 1 Baseline characteristics

Women with previous caesarean section were older (37.1 ± 2.74 vs 35.8 ± 2.98), had a higher BMI (24.6 ± 5.01 vs 23.4 ± 4.24) and had higher rates of endometriosis (20 (10.3%) vs 6 (2.7%) compared to women with previous vaginal deliveries. Women with previous vaginal deliveries had higher rates of male factor 70 (31.3%) vs 42 (21.5%) compared with women with previous caesarean sections.

Objective

Our study aims to see if a history of caesarean section, as compared to a history of vaginal delivery, affects in-vitro fertilisation (IVF) outcomes in KK Women’s and Children’s Hospital (KKH), Singapore. We also looked at the effects of depth of caesarean niche and residual myometrial thickness (RMT) on IVF outcome.

Design

This is a retrospective study of patients with parity undergoing a fresh IVF cycle between July 2018 and June 2020. We included patients with previous one or more caesarean section versus previous vaginal deliveries. If patients had more than one IVF cycles within our 2-year study period, only their first fresh cycle was included. Patients who did not undergo embryo transfer during their fresh IVF cycle were excluded.

Method

The primary outcome was live birth. The secondary outcomes were clinical pregnancy and miscarriage. Multivariate logistic regression analysis was used to adjust for possible confounders such as age, BMI, race, parity and fertility factors. A subgroup analysis of the patients with previous caesarean sections was performed to see if the presence of a niche on imaging further affects IVF outcomes.

Results

We included 196 patients with one or more caesarean section and 223 patients with previous vaginal deliveries. Our study showed that there was no significant difference in rates of live birth (24.0% vs 25.1%), clinical pregnancy (30.3% vs 33.9%) and miscarriage (5.6% vs 7.1%) in patients with previous caesarean section versus vaginal delivery. Among the caesarean section cohort, we included 22 patients with caesarean scar niche, and 104 patients without a niche. The remaining 70 patients did not have their pelvic imaging done in KKH. The prevalence of niche in our cohort was 21%. The average niche depth was 4.3mm (range 3mm to 7mm) and the average RMT was 4.8mm (range 2mm to 8mm). Only one patient had a large niche defect with an RMT of 2mm. There were no significant difference in our clinical outcomes between patients with previous caesarean section with niche versus no niche.

Conclusions

The current study demonstrated no significant differences in IVF outcomes in patients with previous caesarean section versus vaginal delivery. We postulate that this was because the prevalence of niche in our cohort was low, as well as the patients with niche in our study had a good quality scar. This study concurs with the current evidence that if RMT is ≥ 3mm, IVF and pregnancy outcomes are favourable.



Image 1. Ultrasound image of a caesarean section niche on saline-infused sonography, with the residual myometrial thickness (RMT) indicated.

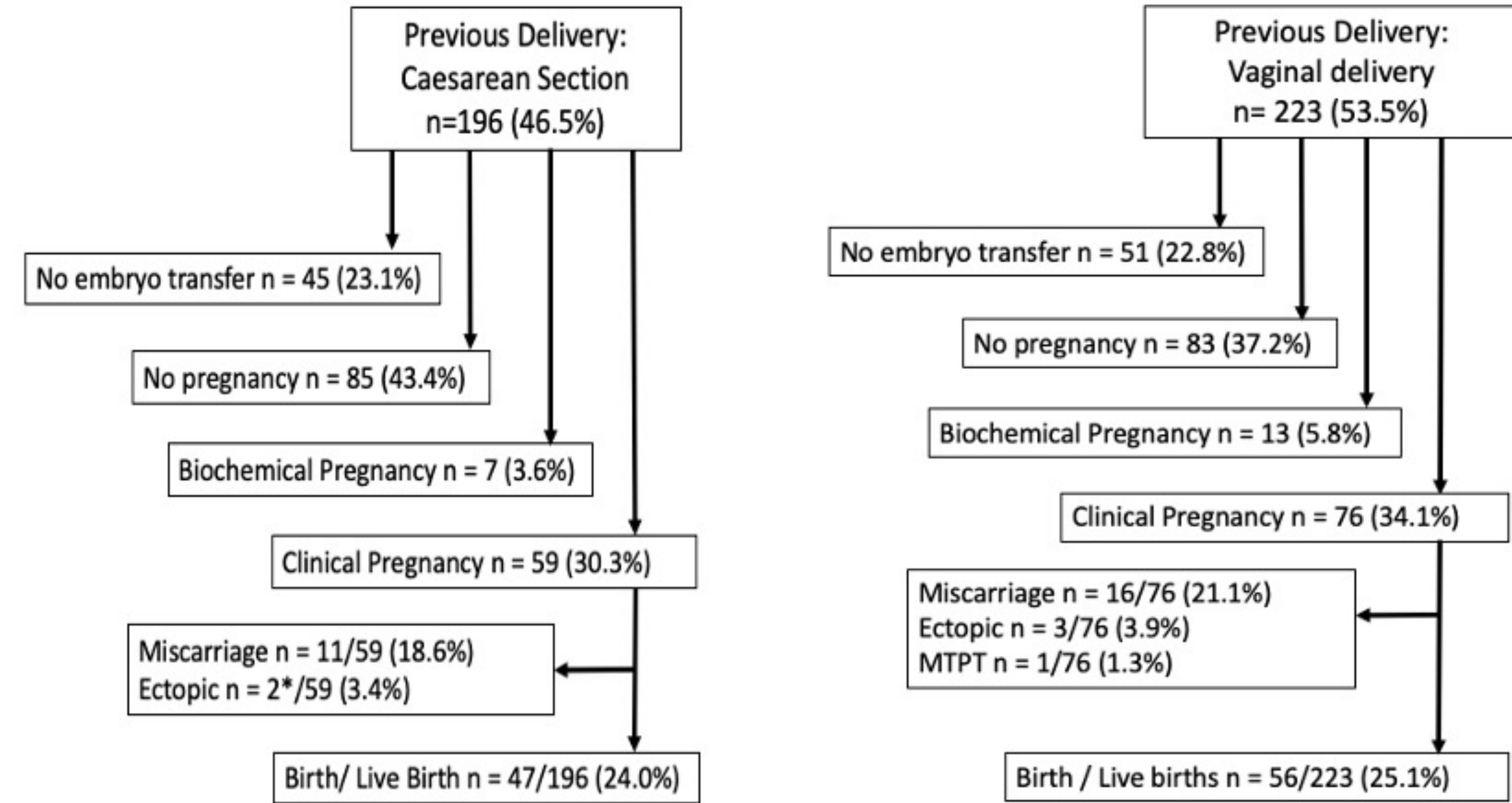


Figure 1 Flowchart of reproductive outcomes after embryo transfer for previous caesarean section versus previous vaginal delivery