

ORIGINAL ARTICLE

Efficacy and safety of Copper Intrauterine Device Insertion during Cesarean Section in Aswan University Hospital

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	Background We aimed to assess the safety, effectiveness, expulsion				
	rates, and complications associated with the copper intrauterine device				
Keywords: Iranscesarean,	(IUD) when inserted during caesarean section and followed up for one				
immediate post-placental IUD insertion	year. This approach is well-suited for our country, where the time of				
	delivery may be the only opportunity for a healthy woman to engage				
	with healthcare providers. Material and methods A group comprising				
	100 women who underwent post placental IUD insertion were				
	monitored at 6 weeks, 3 months, and 6 months after childbirth. Results				
	There were (89%) cases in which IUD continued in place after 6 months				
*Corresponding author:	Total expulsion rate was in 3 cases (3%), Total displacement rate was in				
	4 cases (4%) allover periods of follow up, There were no cases of				
Juhayna Samier Ahmed Abd Elsheikh	perforation and pregnancy reported during the six months of our study.				
Email: iuhavnasamier@gmail.com	Conclusion immediate post-placental IUD insertion is a practical				
	contraceptive choice characterized by a high level of safety, continuity,				
Tel: 0152189424	and convenience.				

ABSTRACT

INTRODUCTION

Unintended pregnancy poses a significant global public health challenge, impacting women, families, and society as well, Approximately 80 million women experience unintended pregnancies annually (Glasier et al. 2006).

Moreover, more than half of non-breastfeeding women ovulate within six weeks postpartum, and a similar proportion resume sexual activity within the same timeframe. (Speroff et al 2008).

According to the Egyptian Demographic and Health Survey (EDHS) of 2014, 16% of births over a five-year period were not intended at the time of conception, including both mistimed and unwanted pregnancies. Of these, slightly over half (8% of all births) were completely unwanted. There was a discrepancy between the total fertility rate and the desired fertility rate, amounting to approximately 0.8



births. Eliminating unwanted births could potentially reduce the total fertility rate in Egypt by 20% (El-Zanaty and Ministry of health Egypt 2014).

PATIENT AND METHODS

This prospective cohort study took place at Department of Obstetrics and Gynecology Aswan University Hospital from March 2022 to February 2024. It focused on women who delivered at the hospital and underwent postpartum intrauterine device (PPIUD) insertion. Counseling on various postpartum family planning options was provided to all pregnant women attending the antenatal clinic or admitted to the labor ward. Those choosing PPIUD were educated about its advantages, disadvantages, efficacy, and potential side effects. Screening for clinical conditions, based on the World Health Organization's medical eligibility criteria, occurred during the antenatal period and immediately before insertion following delivery.

Inclusion criteria: Generally healthy pregnant women scheduled for cesarean section desiring immediate postpartum contraception initiated during the procedure, anatomically normal uterus, Willingness to participate in the study for one year, and ability to attend follow-up.

Exclusion criteria: Uterine infection, Chorioamnionitis (considering other risk factors such as prolonged rupture of membranes >18 hours, prolonged labor >24 hours, fever >38°C), Clinical cervicitis or vaginitis, Suspicion of endometrial or uterine pathology (e.g., congenital malformation of the uterus, large uterine fibromyoma >3 cm diameter), Presence or history of endometrial or cervical malignancy, Undiagnosed genital tract bleeding, Thromboembolic disorders, stroke, Copper allergy (Wilson's disease), Any cardiac, renal, and/or hepatic diseases, placenta previa, and placenta accreta spectrum.

All patients were submitted for detailed history-taking encompassing personal, menstrual, obstetric, and surgical history, along with general and ultrasound examinations. Informed consent was obtained prior to insertion. The IUD placement occurred within 10 minutes post-placental delivery. Follow-up visits at six weeks, three months, and six months postpartum were recommended, with continued follow-up for one year to monitor for pregnancy.

During these follow-up sessions, women were asked regarding any concerns, and a speculum examination was performed to assess the positioning of the IUD strings in the vagina. In cases where the strings were not observable, ultrasound imaging was employed to verify the intrauterine positioning of the IUD. The outcomes of the follow-up appointments, covering issues such as expulsion, displacement, discomfort, extraction, vaginal infection, and other adverse reactions, were recorded for all participants.





Figure 1 showing trans-cesarean IUD insertion.





Figure 1 flow chart of inclusion pathway.

STATISTICAL ANALYSIS

The gathered data underwent tabulation and statistical analysis utilizing SPSS software version 23.0 and Microsoft Excel 2016.

All statistical analyses will be conducted using suitable statistical packages. Continuous variables like age will be presented as mean \pm SD (standard deviation) and range, while qualitative variables will be represented as percentages. A P value of <0.05 will be considered statistically significant.

Kaplan-Meier survival analysis was employed to determine the median duration for expulsion and displacement of the IUD, as well as to assess the probabilities of expulsion and displacement.

Ethical consideration

Confidentiality:

The confidentiality of all patients involved in the study was maintained. None of the study participants were identified by name in any reports or publications resulting from the collected data. Only clinical data devoid of personal identifiers was utilized.



Research statement:

Ethical considerations, both substantive and procedural, were integral to this study. Prior to their participation, all individuals were informed about the purpose and details of the study. Participants comprehended the nature of the study, their right to withdraw at any point, whom to contact for inquiries about the study, and that they provided voluntary informed consent to take part.

RESULT:

This study conducted on 100 pregnant women who have undergone postpartum IUD insertion with follow up visits at the end of 6weeks ,3 months and 6 months.

 Table 1 Demographic data of included females

	Ν	Minimum	Maximum	Median
Age(years)	100	19	41 30	
BMI	100	28	36	32
Parity	100	0	6	2
Residence				
Rural	39 (39%)	-	-	-
Urban	61(61%)	-	-	-
Educational level				
Illiterate	34(34%)	-	-	-
Educated	66(66%)	-	-	-

This table displays the distribution of the cases studied based on demographic characteristics and obstetric history. The age of the cases varied from 19 to 41 years, with a median age of 30 years. The median parity was 2, and the median number of previous cesarean sections was 2. The median gestational age was 38 weeks, and the BMI ranged from 28 to 36. It was noted to be more prevalent among urban residents and women with higher educational attainment.



Table 2 obstetric data of included females

	Ν	Minimum	Maximum	Median
Number of previous section	100	0	5	2

Number of previous section	100	0	5	2
Gestational age(weeks)	100	36	40	38
Time since last delivery	100	1	7	4
Previous abortions	100	0	4	2

This table illustrates Distribution of studied cases as per obstetric history of the median parity was 2 and the median number of previous sections was 2, median gestational age was 38 weeks.

Table 3previous method of included females.

	Frequency	Percent
IUD	50	50%
COCS	20	20%
Progestogen only injectable	9	9%
Implant	8	8%
POPS	4	4%
Combined injectable	3	3%
No method	6	6%
Total	100	100%







Figure 3 flow chart of follow up pathway.



	6 weeks (no = 100)		3 months (no =93)		6 months (no=90)	
	frequency	percentage	frequency	percentage	frequency	percentage
Expulsion	3	3%	0	0%	0	0%
Displaced	2	2%	1	1%	1	1%
Missing threads	18	18%	15	15%	15	15%
Pain	14	14%	5	5%	2	2%
Bleeding	13	13%	5	5%	3	3%
Removal for bleeding	2	2%	0	0%	0	0%
Vaginal infection	12	12%	8	8%	7	7%
Pregnancy	0	0%	0	0%	0	0%
Perforation	0	0%	0	0%	0	0%

Table 4 The frequency and percentage of complications of postpartum IUD insertion.

This table shows distribution of the studied cases regarding complications at different follow-up periods. The results of the Kaplan-Meier survival analysis revealed that the median time for expulsion was 6 months (equivalent to 24 weeks), with a 6-month expulsion probability of 3%.





Figure 2 kaplan miere curve for expulsion rate

Kaplan-Meier survival analysis demonstrated that the median time for displacement was 6 months (equivalent to 24 weeks), with a 6-month displacement probability of 4.1%.





Figure 3 Kaplan miere curve for displacement rate.

Discussion This cohort prospective study conducted at the department of obstetrics and gynecology in Aswan university hospital. This study comprised 100 pregnant women seeking for contraception by IUD (T CU 380) after cesarean delivery. In this study our results showed that the age of cases ranged from 19 to 41 years with mean age \pm SD being 30,92 \pm 5.404 years. The mean parity was 2.46 \pm 1.374, total cases of displacement were 4 cases (4%). There were 3 cases (1.2%) of expulsion. In this study at different follow up periods, in this study the 3 cases of expulsion occurred after six week, IUD was displaced in 2 cases, then after 3 months there was 1 case in which IUD was displaced and another 1 case after six months.

A long with our results **Elsokary et al 2020.**, a randomized control study was conducted at Tanta University Hospital on 51 patients showed Mean age among 51 patients included in the present study was 29.6 ± 5.65 years, mean parity was 2.37 ± 1.22 , high removal rate was detected (7 cases (13%)). The main causes of removal were infections, bleeding and desire of pregnancy, the intrauterine displacement was one case (1.96%). While the expulsion rate was 2 cases (3.92%). there were 7 cases of vaginal bleeding (13.7%) and they all controlled by medical and conservative treatment.

Additionally, **Mansour et al. (2022)** conducted a prospective cohort study at the Department of Obstetrics and Gynecology in Kafr-Eldawar General Hospital and at the Department of Obstetrics and Gynecology in Menoufia University, which involved 164 pregnant women seeking contraception via IUD (T CU 380) following cesarean delivery. The age of the participants ranged from 18 to 40 years, with a mean age of 28.45 ± 5.14 years. The mean gravidity and parity were 2.81 ± 1.22 and 1.68 ± 0.98 , respectively. In terms of IUD removal during various follow-up periods, a total of 8 cases (4.8%) were recorded for the entire study population. Within one week, 2 cases (1.2%) had the IUD removed, one



due to uncontrollable bleeding despite medical intervention and the other due to IUD displacement. Subsequently, at six weeks, 4 cases (2.4%) resulted in IUD removal, with 2 cases attributed to unmanageable bleeding and the remaining 2 cases due to IUD displacement. One case (0.6%) required IUD removal after twelve weeks due to displacement, and another case (0.6%) was removed after six months for the same reason.

Furthermore, Salem et al. (2018) conducted a controlled randomized clinical trial (RCT) at the Department of Obstetrics and Gynecology, Beni Suef University Hospital, involving 94 patients. The average age within this cohort was 29.8 years, with a mean gravidity of 2.7 and mean parity of 2.5.(Salem et al. 2018).

The removal rate observed was 6 cases (6.3%). Among these, three cases had the IUD removed due to vaginal bleeding, one case due to pelvic infection, one case attributed to psychological reasons, and another case due to the loss of a baby and the desire for conception. Additionally, a high expulsion rate of 10 cases (11%) was noted, with 3 cases occurring after one week, 3 cases after six weeks, and 4 cases after six months. Notably, no instances of displacement were reported.

Arshad et al. (2014) conducted a descriptive case series in the Gynecology/Obstetrics Unit at Holy Family Hospital in Rawalpindi, Pakistan, comprising 240 patients aged between 20 and 40 years. Most patients were primiparous, with a history of one previous lower segment cesarean section (LSCS). Regarding the removal of the IUD at various follow-up intervals, a total of 11 cases (11%) were recorded for the entire study population. Within six weeks, the IUD was removed in 7 cases (7%): three due to expulsion, two due to IUD displacement, and two due to uncontrollable bleeding unresponsive to treatment. Subsequently, at 3 months, 3 cases (3%) resulted in IUD removal: one due to IUD displacement and two due to the husband's request. Furthermore, one case (1%) necessitated IUD removal after six months due to IUD displacement. The study by **Arshad et al**. reported a high rate of vaginal bleeding, with 30 cases (11.6%), managed using medical treatment (mefenamic acid).

Similar to our findings, **Gupta et al. (2013)** conducted a prospective observational study involving 150 patients who underwent intra-caesarean IUD insertion at the Department of Obstetrics & Gynecology, LLRM Medical College, Meerut, India. They reported a cumulative number of IUD removals of 8 cases (5.3%). Among these, 3 cases involved IUD removal due to social reasons without medical indications, while 3 cases were removed due to bleeding. Additionally, one case of IUD removal was attributed to the desire for conception, and another case was due to the switch to another contraceptive method. Furthermore, there were 3 cases of expulsion (2%), with no reported instances of IUD displacement. In the trans-caesarean group, bleeding emerged as the most common complication, occurring in 8 cases (5.3%), with medical treatment successfully controlling bleeding in five cases, while IUD removal was required in the remaining three cases.

In a study by **Zaconeta et al. 2019**, This was a prospective cohort study involving 100 women who did not receive prenatal contraception counseling. Post-placental IUD insertion was offered following admission for delivery and performed during cesarean section in the Department of Gynecology and Obstetrics, Medical School, Brazil. The rate of expulsion or removal during the initial 6 weeks after insertion (9.1%) was comparable to that observed between 6 weeks and 6 months post-insertion (9%). Even when considering only women who experienced expulsion, there was no



significant difference between the two-time intervals (5.1% at the 6-week visit versus 3.4% at the 6-month visit). Out of the 97 women who completed the follow-up, 81 (83.5%) retained the IUD six months after cesarean delivery, while 8 (8.2%) experienced expulsion, and 8 (8.2%) requested its removal.

CONCLUSION

Transcesarean IUD insertion is safe and efficient, resulting in a low risk of expulsion and a high rate of continued usage and convenient because it involves a painless insertion process and does not require any delay in starting contraception. SO Eligible mothers who have planned elective C-sections should be offered the option of trans-cesarean IUD placement.

RECOMMENDATION

Healthcare providers and authorities should be informed that immediate post placental IUD insertion represents a favorable, safe, and effective contraceptive method.

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