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Evaluation of Immediate Post-placental Insertion of the Copper Intrauterine Contraceptive Device during Caesarean Delivery

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ABSTRACT

Background: The second most popular type of contraception is an intrauterine contraceptive device (IUCD). Immediate post-placental placement of IUCD provides women with immediate, safe, effective, long-acting reversible contraception that prevents unintended pregnancies.

Objective: The aim of the current work was to evaluate efficacy, safety, and complications (displacement, expulsion, perforation, and infection) of immediate post placental insertion of copper T380 IUCD during cesarean section.

Patients and methods: This prospective study included a total of 164 full term pregnant women delivered through cesarean section, attending at Department of Obstetrics and Gynecology, Menoufia University Hospital and Department of Obstetrics and Gynecology, Kafr El-dawar General Hospital. Post-placental copper T380 IUCD was offered after admission and inserted during cesarean section. Rates of IUCD displacement, expulsion, removal, uterine perforation, pregnancy and infection (endometritis/PID) were estimated at 1 week, 4 weeks, 3 months and 6 months after discharge. The absence of all these complications was considered a satisfactory outcome.

Results: Mean age among study population was 28.45± 5.14 years. Rates of displacement, expulsion and satisfactory outcome at the fourth week post-insertion were 2.5%, 0.6 % and 96.9% respectively. Cumulative rates of displacement and expulsion at the end of 6-months follow-up were 4.3% and 0.6% respectively. No cases complicated by perforation, infection (endometritis/ PID) or pregnancy on top of post placental IUCD. Follow-up rate at the end of 6-months was 94.5%. Continuation rate with intrauterine contraception at the end of 6-months follow-up was 93.9%. Cumulative rate of intrauterine device removal was 6.1%. **Conclusion:** It could be concluded that immediate post placental IUCD insertion is a suitable option with high satisfactory outcome, contraceptive efficacy, safety, and convenience. Complications (displacement, expulsion, perforation and infection) are very low.

Keywords: Caesarean delivery, Immediate, IUCD, Post-placental.

INTRODUCTION

The most extensively used kind of reversible long lasting contraception in the world is the intrauterine device (IUD). It is estimated that approximately 128 million women in the world use it for contraception [1].

IUCD is regarded as the second most popular contemporary form of contraception since it is affordable, secure, long-acting, and reversible with the advantages over hormonal contraception of being independent of women's compliance and not affecting the coagulation or lactation [2].

Interval placement of IUCD is usually performed 6 weeks after delivery. However, women experience difficulties to return for a separate postpartum visit, and it was reported that significant proportion of the postpartum women who decided to use IUCD for contraception had turned out not to have an IUCD inserted. In order to overcome these limitations of interval IUCD placement, an additional postpartum visit is not necessary if the instant implantation occurs within 10 minutes of placenta delivery. IUCD implantation during caesarean birth has shown good rates of device retention and low rates of complications in prior studies [3]. No studies have shown that insertion of an IUCD immediately post-placental increased the risk of infection or any other problems [4].

The aim of the current work was to evaluate efficacy, safety, and complications (displacement, expulsion, perforation, and infection) of immediate post placental insertion of copper T380 IUCD during cesarean section.

PATIENTS AND METHODS

This prospective study included a total of 164 full term pregnant women delivered through cesarean section, attending at Department of Obstetrics and Gynecology, Menoufia University Hospital and Department of Obstetrics and Gynecology, Kafr El-dawar General Hospital. This study was conducted between January 1st, 2021, to April 1st, 2022.

Inclusion criteria:

- Age: 18–40 years.
- Singleton full term pregnancy.
- Voluntarily requesting IUD placement for postpartum contraception.
- No uterine anomalies.

Exclusion criteria:

- Uterine anomalies or pathological uterine lesions preventing IUCD placement e.g. leiomyoma.
- An 18-hour or longer prolonged membrane rupture.
- An intrapartum fever that exceeds 38°C.
- Chorioamnionitis, a genital tract infection that is active yet untreated.
- Disorders with hemorrhage.
- Previous ectopic pregnancies.
- Multiple pregnancy.

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- Preterm labor (<37 weeks gestation).
- Postpartum hemorrhage.

All women were subjected to detailed history taking, clinical assessment and ultrasound examination.

Technique of IUCD post-placental insertion:

- Pre-operative antibiotics were given to all participants per standard of care.
- The placenta was delivered through caesarean section, and the copper T380 IUCD was implanted within 10 minutes after that. After the placenta was delivered, the uterine cavity was examined. IUCD was then inserted through the uterine incision while being held between the middle and index fingers of the left hand, released at the fundus, and the strings were passed through the cervix without disturbing IUCD fundal position. Strings were avoided when stitching up the uterine incision. The strings were severed just past the external cervical os six weeks after insertion.

Follow-up:

Everyone who took part was told to come back for routine follow-up appointments at 1 week, 4 weeks, 3 months, and 6 months after giving birth. Women were advised to call their doctor right away if they had unpleasant vaginal discharge, pelvic discomfort, fever, or heavy bleeding. To reduce follow-up losses, a record of the patient's information, including contact information, was maintained.

Follow up of participants was done by history taking, general examination, vaginal examination including speculum to visualize IUCD threads and transvaginal ultrasound.

Outcome:

Primary outcome: State of IUCD and displacement.

Secondary outcome: Expulsion, perforation, infection, pregnancy and other complications.

Fever (higher than 38ºC) and pungent vaginal discharge were used to determine the severity of the infection. Transvaginal ultrasonography was used to measure device displacement. Following an ultrasound, the expulsion was determined by the lack of threads on vaginal inspection.

Safety (or satisfactory outcome) was defined by absence of all these complications.

Sample size:

Based on past published research revealed that prevalence of cesarean section in Egypt to be 70.4% (5), sample size was calculated at CI 95% using the following equation $n = (z^2 \times p \times q)/D2$ is estimated to be 164 pregnant women delivered by cesarean section to be involved in the study.

***Ethical Consideration*:**

This study was ethically approved by Menoufia University Local Ethics Committee. After explaining the study methodology, written informed consent of all the participants was obtained. The study protocol conformed to the Helsinki Declaration, the ethical norm of the World Medical Association for human testing.

Statistical analysis

SPSS version 26.0, Microsoft Excel 2016, and the MedCalC program software version 19.1 were used to tabulate and statistically analyze the acquired data. The mean, SD, minimum, and maximum of the range were used to compute descriptive statistics for numerical parametric data; the median and first and third interquartile ranges were used to compute descriptive statistics for numerical non-parametric data; and the number and percentage were used to compute descriptive statistics for categorical data. P values lower than 0.05 were regarded as significant.

RESULTS

A total of 164 women delivered by cesarean section with immediate IUCD post-placental insertion were involved in the study. 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. One hundred and ten patients (67%) had history of previous IUCD use while 54 patients (33%) had no previous history of IUCD use. Regarding reason for acceptance of post placental IUCD, the vast majority of cases who had chosen post placental IUCD was due to difficulty to return for a separate postpartum visit (75%) while 22% selected post placental IUCD due to history of difficult interval insertion and 3% used it due to other reasons (Table 1).

Table (1): Main demographic and clinical characteristics of the studied cases (n= 164)

Variables		
Age (years)	**Mean± SD**	28.45± 5.14
	Median	28.0
	Range	18.0 – 40.0
Gravidity	**Mean± SD**	2.81± 1.22
	Median	3.0
	Range	0.0 – 7.0
Parity	**Mean± SD**	1.68± 0.98
	Median	2.0
	Range	0.0 – 5.0
Previous IUCD use	**Yes**	110 (67%)
	No	54 (33%)
Reasons for acceptance of post placental IUCD	**Difficulty to return for a separate visit**	123 (75%)
	History of difficult interval insertion	36 (22%)
	Other reasons	5 (3%)

SD= standard deviation, n: number, %: percentage,

Regarding state of IUCD at different follow-up periods, one week post insertion, IUCD was in place in 161 (98.2%) cases, removed in 3 cases (two cases due to bleeding and one case due to displacement). Among the 164 participants, 161 returned for the 4-weeks follow-up visit, five of them (3.1%) underwent IUCD removal (four cases due to displacement and one case due to expulsion). Therefore, continuation rate of copper intrauterine device at 3 months post-insertion was 95% (156 women). There was one case in which IUCD was removed after three months of insertion (due to displacement). One Hundred Fifty-Five women returned for the 6-months follow-up visit, and one (0.6%) of them had IUCD removal (due to displacement). Therefore, One Hundred Fifty-Four (93.9% of the study population) remained with copper intrauterine device after 6-months follow-up. The cumulative rate of intrauterine device removal was 6.1% (10 cases) (Table 2).

Table (2): State of IUCD at different follow-up periods

State of IUCD		**Frequency**	**Percentage**
After One week (n=164)	**In place**	161	98.2%
	Removed	3	1.8%
After 4 weeks (n=161)	**In place**	156	96.9%
	Removed	5	3.1%
After 3 Months (n=156)	**In place**	155	99.4%
	Removed	1	0.6%
After 6 Months (n=155)	**In place**	154	99.4%
	Removed	1	0.6%
Cumulative removal rate at the end of 6-months follow-up	10 (6.1%)		
Cumulative continuation rate at the end of 6-months follow-up	154 (93.9%)		

Table 3 shows the outcome/ complications of post placental IUCD at different follow-up periods. After the first week post-insertion, IUCD was displaced in one (0.6%) case and bleeding occurred in two (1.2%) cases. Rates of displacement, expulsion and satisfactory outcome at the fourth week post-insertion were 2.5% (4 cases), 0.6 % (one case) and 96.9% (156 cases) respectively. There was one case in which IUCD was displaced after three months and another one after six months. No cases complicated by perforation, infection (endometritis/ PID) or pregnancy on top of post placental IUCD in the current study.

Table (3): Outcome/ complications of immediate post placental IUCD insertion at different follow-up periods

Outcome/ complications		**Frequency**	**Percentage**
After One week (n=164)	**Satisfactory outcome**	161	98.2%
	Bleeding	2	1.2%
	Displacement	1	0.6%
	Expulsion	0	0
	Endometritis	0	0
After 4 weeks (n=161)	**Satisfactory outcome**	156	96.9%
	Bleeding	0	0
	Displacement	4	2.5%
	Expulsion	1	0.6%
	Endometritis/PID	0	0
After 3 Months (n=156)	**Satisfactory outcome**	155	99.4%
	Bleeding	0	0
	Displacement	1	0.6%
	Expulsion	0	0
	Endometritis/PID	0	0
	Pregnancy	0	0
After 6 Months (n=155)	**Satisfactory outcome**	154	99.4%
	Bleeding	0	0
	Displacement	1	0.6%
	Expulsion	0	0
	Endometritis/PID	0	0
	Pregnancy	0	0
Cumulative displacement rate at the end of 6-months follow-up	7 (4.3%)		
Cumulative expulsion rate at the end of 6-months follow-up	1 (0.6%)		
Cumulative rate of post-insertion bleeding at the end of 6-months follow-up	2 (1.2%)		

DISCUSSION

We aimed to evaluate efficacy, safety, and complications (displacement, infection, perforation, and expulsion) of post placental IUCD (copper T380) inserted in 164 women during cesarean section.

Our results showed that the age of 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 with G2P1 was the most common representing 28.7% of studied cases.

Consistent with our finding, Shahienaz and her colleagues conducted a study among 60 participants and showed that the mean age was 25.10 years with 53.3% of them 25 years and mean parity was 2.23(6).

In our study, the cumulative continuation rate of copper intrauterine device at the end of 6-months follow-up was 93.9% (154 women) and the cumulative removal rate of intrauterine device at the end of 6-months follow-up was 6.1% (10 women).

Similar to our results, **Sucak and his colleagues [7],** reported that the cumulative rate of intrauterine device removal in the entire research population was 7.8%. In all groups, the removal rates of intrauterine devices were comparable.

Regarding outcome/ complications of post placental IUCD at different follow-up periods. Cumulative rates of displacement, expulsion and bleeding at the end of 6-months follow-up were 4.3%, 0.6% and 1.2% respectively. No cases complicated by infection (endometritis/ PID) or pregnancy on top of post placental IUCD in our study.

Whitaker and his colleagues [8], in agreement with our results, reported that there was no difference in the incidence of postpartum bleeding or infection after immediate post placental IUD insertion.

According to multiple studies evaluating the results of post-partum IUCD insertion at various time intervals, delayed postpartum insertion was associated with higher expulsion rates than rapid insertion **[9,10,11]**, which is consistent with our findings.

Heller and his colleagues [12] also reported low complication rates after post-placental IUD. Cumulative expulsion rate at the end of 12-months follow-up was 8.8% [12]. **Celen *et al.*[13]** also observed that overall 1-year expulsion rate after post-placental IUD was 12.3%.

CONCLUSION

It could be concluded that immediate post placental IUCD insertion is a suitable option with high satisfactory outcome, contraceptive efficacy, safety, and convenience. Complications (displacement, expulsion, perforation, and infection) are very low.

LIMITATIONS

There are not much data from our country. To reinforce the present study results, we are expecting large scaled randomized studies involving many institutions before we declare that post-placental IUD insertion is completely safe.

Supporting and sponsoring financially: Nil.
Competing interests: Nil.

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