Evaluation of IUD Insertion During CS In 100 Patient. A Prospective Study

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Abstract: Background: The application of an IUD to the female after placenta delivery during a caesarean section had several benefits since the female was under anesthetic, which reduced the need for additional manipulation and pain, and the female at the time of delivery had a strong desire for family planning. IUDs placed postpartum experienced numerous disengagements, including bleeding and displacement. Objectives: To evaluate the efficacy of post placental IUD insertion during cesarean section in 100 patients. Patient and methods: A prospective study was conducted at obstetrics and gynecology department of Damanhur Medical National Institute in the period from March 2022 to March 2023. Group I: included 52 women who agreed to insert immediate post placental IUD at the cesarean delivery. Group II: included 48 women as control group. The type of IUD used was cupper-T IUD, both groups were assessed as regard to time of cesarean section (CS), amount of postoperative bleeding, postoperative pain, occurrence of infection, any displacement of IUDs, failure of contraception and patients' satisfaction. Results: In both groups, the demographic information was comparable. The medical histories of the investigated patients and the control group did not differ significantly according to our research. The study group's caesarean procedure took a little longer to complete. There were no appreciable differences between the two groups in terms of infection, puerperal hemorrhage, or IUD displacement. Both groups' satisfaction levels were displayed as either pain or displacement. In the research and control groups, the expulsion rates were 3.92% and 0.00%, respectively. Conclusion: Based on our research, we draw the conclusion that IUD insertion during CS is safe and effective, avoiding the reasons why it can be challenging to insert an IUD after puerperium and having a low expulsion rate; so, it can be considered a standard procedure.

Keywords: Intrauterine Device, Post-Placental Insertion, Contraception, Displacement, Pregnancy Spacing and Time of Insertion

1. INTRODUCTION

Traditionally, postpartum birth control initiation has been delayed until the 6-week postpartum visit, and women are discharged from the hospital with instructions to avoid sexual activity until 6 weeks postpartum **[1].** Waiting until the 6- week postpartum visit to initiate a method of birth control puts women at risk for unintended pregnancy in this immediate postpartum period. Most women are sexually active by 6 weeks postpartum, and women who deliver by cesarean may be more likely to resume sexual activity earlier than women who had vaginal deliveries **[2].**

The intrauterine device (IUD) is an effective, long-lasting, and reversible method of birth control, with a cumulative pregnancy rate of less than 1 per 100 women within the first year of use **[3].** Immediate postpartum IUD insertion has been established as a safe alternative to interval insertion. Specifically, the use of a copper T380A IUD in the immediate postpartum period, including after cesarean delivery, has a category 1 rating in the World Health Organization's medical eligibility for contraceptive use **[4].**

Theoretically, when IUDs are placed at the time of cesarean delivery, the cervix is frequently not fully dilated, making it more difficult for the IUD to be expelled through the cervical canal. Additionally, it is technically easier to achieve appropriate fundal placement of the IUD during cesarean delivery because the entire uterus can be visualized, palpated, and manually explored within the surgical field **[5].** Immediate intra-caesarean IUD insertion after placental delivery provides changeable and efficient long-term contraceptive that does not interfere with lactation.

It may also eliminate the pain associated with normal insertion, and lochia will hide any insertion blood. The lady is known to be not pregnant, thus contraception will be a key priority for her **[6].** The present study is designed to

evaluate the efficacy and complications (expulsion rate, discomfort, and quantity of hemorrhage) of IUD insertion during CS.

Patient and Methods

This is a prospective study; that will be carried out on a total sample of 100 women patients who will be planned for an optional caesarean section. The study will be conducted between March 2023 and March 2023 at obstetrics and gynecology department of Damanhur Medical National Institute.

Inclusion criteria: Pregnant women between the ages of 18 and 40 who are planning an elective cesarean delivery at a gestational age of 37 to 40 weeks and are looking for contraception after birth.

Exclusion criteria: History of menorrhagia or extreme dysmenorrheal, history or existing of pelvic inflammatory disorder (ex: puerperal sepsis, purulent cervicitis), ruptured membranes for more than 24 hours prior to delivery, patients with bleeding abnormalities, structural uterine abnormality or large uterine fibroids distorting anatomy, history of past IUD expelling or removal for problems, history of ectopic pregnancy, and ante- or intrapartum hemorrhage.

Informed consent: All the patients gave written informed consent after being counselled regarding the objectives and the procedure of the study.

Post placental IUD Insertion: Immediately after the recommendation of a cesarean delivery, all women will be given the option of IUD insertion at surgery, and their questions regarding this type of contraceptives will be explained. Lower segment cesarean section by standard technique then at cesarean insertion, place the IUD at the top of the uterine fundus manually (Cupper T380). Before closing the uterine incision, place the strings in the lower uterine segment and finally, Strings are passed through the cervix with IUD insertion tube.

All patients' demographic data will be taken, type of cesarean, duration of surgery, post-operative bleeding, pain, infection, failure rate and patient's satisfaction (known by simple questioning of patient, and the presence or absence of any complaint regarding IUD). IUD displacement will be checked by Ultrasound examination at 3 months, 6 months, and 12 months intervals.

Outcomes: Primary outcome: Successful placement, subsequent expulsion. Secondary outcome: Bleeding, pain, and other adverse events.

Ethical aspects: The study protocol will be approved by the Ethics Committee of GOTHI research center. Written informed consent will be obtained from the patients or their legal representatives according to the patient's condition before enrollment.

2. STATISTICAL ANALYSIS

IBM SPSS version 22.0 will be used to analyze computer-generated data. To express quantitative data, percentages and numbers will be employed. Before utilizing the median in nonparametric analysis or the interquartile range in parametric analysis, it will be required to perform Kolmogorov-Smirnov tests to ensure that the data will be normal. We used the (0.05) significance threshold to establish the significance of the findings. The Chi-Square test is used to compare two or more groups. The Monte Carlo test may be used to adjust for any number of cells with a count less than 5. Fischer Chi-Square adjustment will be applied to tables demonstrating non continuous data.

3. RESULTS

At the Department of Obstetrics and Gynecology at Damanhur Medical National Institute. The study will be conducted between March 2023 and March 2023. Prospective study of 100 women who were scheduled for an

optional cesarean section was conducted. The 100 studied women were randomly divided into two groups: Group I: included 52 women who agreed to insert immediate post placental IUD at the cesarean delivery. Group II: included 48 women as control group. The mean age was 29.58, the mean BMI was 25.64, the mean gravidity was 2.56, Gestational age (weeks) was 35.7 and number of cesarean scars were 1.7 without significance when compared to control group. Table 2 showed no significant difference of the medical history of studied patient versus control group presented as percentage.

The data presented in Table 3 were found to be non-significant between studied group and control group. Patient were asked by simple questioning about type of cesarean; the majority were low transverse with percentage 80 followed by 13% low vertical and rarely high vertical section with 7%. The actual cesarean operation usually takes 35.2 minutes. Majority of cases might have some bleeding for up to 6 weeks in 27 % of studied cases. Most women experience some discomfort for the first few days after a caesarean, and for some women the pain can last several weeks. Surgical site infection (SSI) is one of the most common complications following cesarean section and has an incidence of 7.1%. The failure rate of the studied patients was 3 % as showed in Table 3.

As demonstrated in Table 4; Patient's satisfaction presence or absence of any complaint regarding IUD were obtained by questioning. The most common side effect of the copper IUD is heavier periods especially in the first 3 to 6 months after insertion. Other side effects may include heavier or longer periods. spotting between periods in 76% of studied cases. IUD displacement is most common within the first few months after you get it put in. They also tend to move more if you have strong cramps during your period, have an extreme tilt to your uterus, or a small uterine cavity that tend to increase the probability of displacement with time. 3% of studied patient was expulsed after 3 months, 5 % after 6 month and 8 % after 12 months.

Table 4 showed the primary outcome including 84.2 % have a successful placement and 15.8 % have subsequent expulsion. The Secondary outcome included 89.1% of cases have bleeding and 46.3 % of cases have pain associated with IUD placement.

Table 1: Socio demographic characteristics of studied patients

Demographic characteristics	Group I Study group Mean ±SEM n=52	Group II Control group Mean ±SEM n=48	Chi-Square
Age (years)	29.58 ± 5.04	26.73 ± 5.09	0.523
BMI (kg/m^2)	25.64 ± 2.86	24.64 ± 1.86	0.098
Gravidity	2.56 ± 1.15	1.9 ± 1	0.267
Gestational age (weeks)	35.77 ± 1.40	35.47 ± 2.08	0.654
No of cesarean scars	1.7 ± 0.2	1.7 ± 0.5	0.343
Education High Low	 56 % 44 %	 59 % 41 %	 0.5

SEM: Standard Error of Mean

*: p value Statistically significant at $p \leq 0.05$

Table (2): Medical history of studied patients

Medical history	Group I Study group n=52	Group II Control group n=48	Chi-Square
Menorrhagia	13%	13%	0.1
Extreme dysmenorrheal	17%	17%	2.911
Pelvic inflammatory disorder Puerperal sepsis Purulent cervicitis	 2% 3%	 2% 3%	0.18%
Ruptured membranes for more than 24 hours prior to delivery	1%	1%	1
Bleeding abnormalities	24%	24%	0.009
Structural uterine abnormality	10%	10%	0.1
Large uterine fibroids distorting anatomy	9%	8.5%	0.06
Past IUD expelling or removal for problems	8%	7.9%	0.1
Ectopic pregnancy	7%	6.7%	0.7
Ante- or intrapartum hemorrhage	6%	6.4%	1.5

*: p value Statistically significant at p ≤ 0.05

Table (3): Information related to cesarean operation of studied patients.

	Group I Study group n=52	Group II Control group n=48	Chi-Square
Type of cesarean Low transverse Low vertical High vertical	 80% 13% 7%	 78% 12% 7%	 0.1
Duration of surgery	35.2 ± 2.70	30.2 ± 1.50	2.911
Post-operative bleeding	27 %	28%	0.18%
Pain Yes No	 24% 76 %	 29% 71 %	 1
Infection	7.1%	8.4%	0.009
Failure rate	3%	2%	0.1

SEM: Standard Error of Mean
*: p value Statistically significant at p ≤ 0.05

Table (4): Patient's satisfaction presence or absence of any complaint regarding IUD

	Group I Study group n=52	Group II Control group n=48	Chi-Square
Presence of complaint regarding IUD Yes No	 76% 24%	 73% 27%	 0.7
IUD displacement 3 months 6 months 12 months	 3% 5% 8%	 2.5% 4.8% 8.2%	 2.9

*: p value Statistically significant at p ≤ 0.05

Table (5): Primary and secondary outcome of the studied patients

	Group I Study group n=52	Group II Control group n=48	Chi-Square
Primary outcome			
Successful placement	84.2%	82.4%	
Subsequent expulsion	15.8%	17.6%	0.8
Secondary outcome			
Bleeding	89.1%	88.7%	1.4
Pain	46.3%	46.9%	

4. DISCUSSION

Intrauterine contraceptive device (IUD) is considered the most acceptable and widely used methods of contraception, being safe, cheap, long acting, and reversible. More over IUDs related complications could be avoided by aseptic technique during its insertion, and proper method for its insertion [7].

Women who undergo a cesarean section (CS) are in a unique position to receive the intrauterine contraceptive device (IUD). They may also want to use the IUD as a long-acting reversible contraceptive method provided the IUD is safe and effective in the presence of a CS scar. The IUD is a long-acting reversible contraceptive method that is suitable for use in all women undergoing CS. The problems of device expulsion, missing threads at follow-up, and the tendency of increased puerperal bleeding need to be solved. Solutions are proposed [8].

There is still a debate about the best timing of IUD insertion after cesarean delivery. Some gynecologists prefer its insertion during cesarean section [9], while others prefer interval insertion, 3 months after cesarean section [10]. In the current study, post-placental insertion of IUDs was like interval group as regard bleeding, pain, displacement, and infection rates.

The present study is designed to evaluate the efficacy and complications (expulsion rate, discomfort, and quantity of hemorrhage) of IUD insertion during CS. All patients' demographic data will be taken, our study included mean age of studied patients were 29.58, the mean BMI was 25.64, the mean gravidity was 2.56, Gestational age (weeks) was 35.7 and number of cesarean scars were 1.7 without significance when compared to control group.

Type of cesarean, duration of surgery, post-operative bleeding, pain, infection, failure rate and patient's satisfaction (known by simple questioning of patient, and the presence or absence of any complaint regarding IUD) also obtained. There was no substantial variation among the included subjects regarding age, BMI, Gravidity and Education ($p > 0.05$).

IUD displacement will be checked by Ultrasound examination at 3 months, 6 months, and 12 months intervals. Primary and secondary outcome also evaluated expressed as successful placement, subsequent expulsion, bleeding, and pain. The overall displacement rates were not significantly different in both groups. **Caliskan et al. (2003)** evaluated the risk of IUD displacement on 8343 women. They found that 18 females during the study suffered from uterine perforation. The risk of perforation was less in post placental IUD insertion than in interval insertion group **[11]. Elsokary et al** study showed no cases of perforation occurred due to experience of the operating team with the techniques of IUD insertion and it was agreed to our study **[12].**

There is a significant difference between both groups regarding the time of cesarean section with mean time of in group I and group II respectively. This prolongation in study group was due to the duration of IUD insertion. Post placental insertion of IUD had advantages of being painless procedure as it is done under anesthesia, while interval insertion of IUD after cesarean is painful. Moreover, enthusiasm of patients in the immediate postpartum period was

found to be higher than delayed IUD insertion group. These advantages make this method of insertion getting more popular and widely accepted by many gynecologists and patients [**12]**.

While the expulsion rate was also slightly higher in the study group than interval group (3.92% versus 0.00% respectively), the overall displacement rates were not significantly different in both groups **[12].**

Patient's satisfaction presence or absence of any complaint regarding IUD were obtained by questioning and they recorded IUD insertion at the time of cesarean delivery is safe and acceptable method **[12].** The most common side effect of the copper IUD is heavier periods especially in the first 3 to 6 months after insertion. Other side effects may include heavier or longer periods. spotting between periods in 76% of studied cases. UD displacement is most common within the first few months after you get it put in. They also tend to move more if you have strong cramps during your period, have an extreme tilt to your uterus, or a small uterine cavity that tend to increase the probability of displacement with time **[12].** 3% of studied patient was expulsed after 3 months, 5 % after 6 month and 8 % after 12 months.

Our study showed the primary outcome including 84.2 % have a successful placement and 15.8 % have subsequent expulsion. The Secondary outcome included 89.1% of cases have bleeding and 46.3 % of cases have pain associated with IUD placement. **Şevki Ç. et al. (2011)** conducted a similar study and they found that there were no serious complications from post placental IUD insertion **[13].** They also reported that spontaneous expulsion of IUD was 2.4%, while expulsion in the current study was 3.92%. This difference is owing to small sample size in the current study [13]. Other studies reported higher expulsions rates up to 10.68% **[14],** and 17% **[15].**

Surgical site infection (SSI) is one of the most common complications following cesarean section and has an incidence of 7.1%. The failure rate of the studied patients was 3 %. Infection rates and types were also similar in both study and control group according to **Elsokary et al** study [12]. Similar results were obtained by **Welkovic et al. (2001)** and **Evelyn et al. (2012)** where they found that 5 cases out of 245 had endometritis in the post-placental-IUD group (3.4%) and 7 cases out of 157 women without IUD insertion [16] [17]. After post-placental insertion, the risk of infection is minimal, and randomized investigations have revealed no variation in infection rates depending on insertion date **[21].**

The undescended threads after one year of follow up were more in the study group where 30 cases not feeling threads compared to 6 cases only not feeling threads in the control group, with p-value of <0.001. Similar results were obtained by **Hooda et al. (2016)** where strings were high in 38% of cases in the post-placental insertion group with highly significant difference between both groups (p = 0.001) [**22].**

In the current study, the discontinuation rate at 3, 6, 12 months of follow up periods were similar in both groups. The main causes of discontinuations were infections, bleeding, and desire of pregnancy. The satisfaction of cases with IUD was high in both groups with 90.20% and 91.67% satisfaction rates in study and control groups respectively. The same results were obtained by Levi et al. (2015) where most women in both groups were satisfied with their IUDs and satisfaction rates in the intra-cesarean group, 92% (36/39) and 100% (30/30) of the women in the interval group. The same was concluded by **Heller et al. (2017) [20] [21] [23] [24].** In agreement with our result Welkovic et al.[13]studied There was no change in the prevalence of severe bleeding following the placement of a post-placental IUD **[20].**

The study had a few limitations, including missed cases in follow up period , availability of IUD during emergency cesarean section and some cases who were randomly allocated in group 2, after the three months period, changed their mind and refused to use IUD and preferred another method for contraception usually Combined contraceptive pills.

Leia raphaelidis et al. concluded that The IUD has been proved to be the favored alternative for women searching for dependable long-term contraceptive, despite the fact that the installation technique may sometimes be challenging

owing to severe anteverted or retroverted uterus, severe pain, and vasovagal attack **[18**]. **Çelen et al.** concluded that the use of a post-placental IUD offers various benefits. It offers rapid contraception without interfering with breastfeeding and may reduce insertion pain **[19].**

CONCLUSION

A long-acting type of contraception that is commonly used and approved is the intrauterine device. It has been determined that post-placental IUD insertion is safe, simple to use, and only slightly extends the length of the caesarean surgery. In comparison to interval IUD implantation, post-placental IUD insertion has less difficulties but is still effective. The vast majority of patients approved this method of insertion because it was painless, performed concurrently with surgery at no additional cost or effort, and made use of the patients' eagerness for rapid contraception. The study's follow-up period had good continuation rates. Based on our research, we draw the conclusion that IUD insertion during CS is safe and effective, avoiding the reasons why it can be challenging to insert an IUD after puerperium and having a low expulsion rate; so, it can be considered a standard procedure.

Declarations

Ethics Approval and Consent To Participate

Consent for publication

Not applicable.

Availability of Data and Materials

All data and materials are fully presented in the manuscript.

Competing Interests

The authors declare that they have no competing interests.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Author contributions

Dr Ahmed will write the protocol and Dr Tamer will collect specimens, follow up of the cases, will take the history and fulfill inclusion and exclusion criteria. Dr Ahmed and Dr Tamer we will analyze the results together.

Acknowledgements

We would like to acknowledge staff members of ----------

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