



2024

Section: Obstetrics and Gynecology

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How to Cite This Article

Wafa, Yehia Abdel Salam; Alomda, Fahd Abd Elaal; and Nasr, Ahmed Shokry Ahmed (2024) "Comparison between Cu T 380 A IUCD Insertion during Cesarean Section with Fixation and 6 Weeks Postpartum," *Al-Azhar International Medical Journal*: Vol. 5: Iss. 3, Article 6.

DOI: <https://doi.org/10.58675/2682-339X.2315>

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Comparison Between Copper T 380 A Intrauterine Contraceptive Device Insertion During Cesarean Section With Fixation and 6 Weeks Postpartum

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Abstract

Background: Suturing to the uterine fundus during a cesarean delivery utilizing the hung-up approach for immediate postplacental implantation of intrauterine contraceptive device (IUCD) copper T (Cu T 380A) is a safe and successful procedure; no cases of ejection or perforation have been documented.

Aim: The purpose of this study is to assess the safety and effectiveness of inserting an IUCD with fixation during a lower segment cesarean section as a method of contraception, as well as the impact of fixation on the expulsion rate in comparison to the traditional approach.

Patient and methods: At Al Galaa Maternity Teaching Hospital, a prospective randomized interventional case-control study was carried out between November 2020 and November 2022. Three groups of participants were formed.

Results: Regarding the visual analogue scale score, number of pads, blood clots, presence of pelvic infections disease, bleeding pattern, and hemoglobin examinations before and 6 months after IUCD implantation, there was no statistically significant difference between the analysed groups.

Conclusion: Compared with nonfixed IUCD, copper T IUCD, which was introduced right after the placenta was expelled during a lower segment cesarean section, had superior efficacy, safety, and convenience. The least amount of expulsion and the best overall health outcomes across all research points were obtained with IUCD insertion and fixation using absorbable suture (hang up method).

Keywords: Cesarean section, Comparison, Copper T 380 A intrauterine contraceptive device, Fixation

1. Introduction

Unplanned pregnancies during the postpartum period are most likely to result in negative outcomes such as abortion, early labor, hemorrhage, low birth weight infant, fetal loss, and maternal mortality.¹

An estimated 214 million women in low- and middle-income nations wish to postpone or avoid getting pregnant but are not utilizing a contemporary kind of contraception at this time.²

As an effective postpartum contraceptive alternative, immediate postpartum long-acting reversible intrauterine contraception device (IUCD) insertion has few negative effects, according to the American

College of Obstetricians and Gynecologists' recommendation.³

Suturing to the uterine fundus during a cesarean delivery utilizing the hung up approach for immediate postplacental implantation of IUCD copper T (Cu T 380 A) is a safe and successful procedure, no cases of ejection or perforation have been documented.⁴

Pelvic inflammatory illness, sepsis, and spontaneous abortion in cases of unplanned pregnancy with the IUCD in situ, ejection, total or partial uterine perforation, menstrual abnormalities, and an increased risk of ectopic pregnancy are among the potential problems linked to IUCD.⁵

The suggestion is tracked and eliminated using the IUCD strings. Generally speaking, the vaginal

Accepted 25 November 2023.
Available online 6 May 2024

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<https://doi.org/10.58675/2682-339X.2315>

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string's presence indicates the presence of the IUCD. A missing string is the first sign of a perforation in around 80% of cases.⁶

According to medical eligibility criteria set forth by the WHO, if postpartum insertion takes place between 48 h and 4 weeks, the dangers usually exceed the benefits. However, a high chance to accomplish long-term contraception with little discomfort to the patient is presented by the immediate postpartum IUCD insertion through the hysterotomy within 10 min. This technique of IUCD implantation has not been linked to any increased risk of infection or other problems, according to any studies.⁷

The study's objectives of this study was to assess the safety and effectiveness of IUCD insertion with fixation during a lower segment cesarean section (CS) as a form of contraception, as well as the impact of fixation on the expulsion rate in comparison to the traditional approach.

2. Patient and methods

In Al Galaa Maternity Teaching Hospital, 348 female cases were the subjects of a prospective randomized interventional case control research that ran from November 2020 to November 2022. Three groups of participants were formed.

Group A included 116 women who had an IUCD inserted during a CS postpartum delivery; the IUCD was inserted through a uterine incision, placed at the fundus, and the thread was pushed through the cervical internal os from inside the uterus. The IUCD was then fixed to the uterus using the hang-up technique, which entails puncturing the fundus wall in the middle using a straight needle into the uterine cavity, tying the IUCD with an anchor knot using vicryl 1–0, and hanging the IUCD to the in fundus. The threads were shortened via the vagina 2 cm below the level of the external os after the anterior abdominal wall was closed.

Group B comprised 116 women who had an IUCD inserted during a CS postpartum delivery; the IUCD was secured to the uterus by two stitches using vicryl suture 2–0 at the transverse limb's periphery. The IUCD was inserted through the uterine incision and placed at the fundus. The thread was pushed through the cervical internal os from inside the uterus. The threads were shortened via the vagina 2 cm below the level of the external os after the anterior abdominal wall was closed.

Group C included 116 of women who had lower uterine CS in whom the IUCD was inserted at reproductive health services center of Al Galaa Maternity Teaching Hospital after 6 weeks postpartum.

All participants were counseled about the use of IUCD (cu TA380) as a method of contraception and written consent was taken from all recruited patients to be enrolled in the study, and also counseled the possible complications regarded IUCD insertion.

Inclusion criteria: age between 18 and 40 years, elective lower segment cesarean section and one or more previous cesarean section.

Exclusion criteria: a nulligravida, women with a history of pelvic inflammatory disease, ectopic pregnancy, bleeding disorders, rupture of membranes prior to admission, chorioamnionitis, etc. delivery of a stillborn child at CS, and uterine fibroids (distorting uterine cavity) are among the women who are at risk for postoperative infection.

All women were subjected to history taking (personal, medical, surgical, obstetric, previous contraceptive methods, and family history), general and pelvic examination. Every woman was checked on every week, every 6 weeks, and every 6 months. Each time included history talking, general and vaginal examination including speculum to visualize the threads of IUCD, Complete blood count and transvaginal ultrasound (TVS) and or radiography on pelvis with sound in case of missed IUCD. Follow-up was concise to primary and secondary outcomes.

2.1. Primary outcome

The rate of expulsion in the first 6 months after insertion. The expulsion was diagnosed by the woman history or by TVS and pelvic-abdominal radiography to exclude perforation.

2.2. Secondary outcome

Degree of pain whether backache or dysmenorrhea was assessed by visual analogue scale (VAS). Bleeding was judged by: Pattern of bleeding, Number of soaked pads, Presence of blood clots and Hb level were checked before and 6 month of IUCD insertion.

Pelvic infection was assessed by: fever, uterine tenderness, cervical motion tenderness and offensive vaginal discharge. Perforation was diagnosed by TVS and pelvis-abdominal radiography. Pregnancy was confirmed by pregnancy test and TVS.

2.3. Statistical analysis

All data were collected, tabulated and statistically analysed using SPSS 26.0 for windows (SPSS Inc., Chicago, IL, USA). Quantitative data were expressed as the mean \pm SD, and qualitative data were expressed as absolute frequencies (number)

and relative frequencies (percentage). One way ANOVA test was used to compare between more than two groups of normally distributed variables. Percent of categorical variables were compared using χ^2 test. Person's correlation coefficient was calculated to assess relationship between various study variables, (+) sign indicate direct correlation and (–) sign indicate inverse correlation, also values near to 1 indicate strong correlation and values near 0 indicate weak correlation. All tests were two sided. *P* value less than 0.05 was considered statistically significant (S), *P* value greater than or equal to 0.05 was considered statistically insignificant (NS).

3. Results

Table 1.

Table 1. Patients' basic characteristics of the studied groups.

Characteristic	Study group (n = 348)			Test <i>f</i>	<i>P</i> value	Post hoc
	Group A (n = 116)	Group B (n = 116)	Group C (n = 116)			
Age (years)	28.36 ± 5.19	28.29 ± 5.27	27.19 ± 5.49	1.776	0.171	<i>P</i> ₁ = 0.921 <i>P</i> ₂ = 0.094 <i>P</i> ₃ = 0.115
Mean ± SD	(19–39)	(19–40)	(19–41)			
Weight (kg)	76.36 ± 7.44	74.34 ± 5.58	67.98 ± 7.23	47.957	<0.001*	<i>P</i> ₁ = 0.024* <i>P</i> ₂ <0.001* <i>P</i> ₃ <0.001*
Mean ± SD	(57–90)	(59–90)	(52–91)			
Height (cm)	161.92 ± 4.52	161.94 ± 12.41	162.42 ± 3.94	0.143	0.867	<i>P</i> ₁ = 0.987 <i>P</i> ₂ = 0.637 <i>P</i> ₃ = 0.649
Mean ± SD	(150–173)	(39–179)	(155–178)			
Category	Number (%)	Number (%)	Number (%)	χ^2	<i>P</i> value	
Medical Hx						
Free	102 (87.9)	103 (88.8)	105 (90.5)	1.519		
BA	8 (6.9)	7 (6)	4 (3.4)		0.823	
PIH	6 (5.2)	6 (5.2)	7 (6)			
Surgical Hx						
Cholecystectomy	2 (1.7)	2 (1.7)	1 (0.9)			
Appendectomy	5 (4.3)	5 (4.3)	3 (2.6)			
Tonsillectomy	8 (6.9)	3 (2.6)	5 (4.3)	9.705	0.467	
hemorrhoidectomy	2 (1.7)	0 (1)	0.9 (0)			
Free	99 (85.3)	106 (91.4)	106 (91.4)			

(*f*) = one way -analysis of variance test, (χ^2) = chi-square tests.

Post Hoc Tests: *P*₁ = group A versus group B; *P*₂ = group A versus group C; *P*₃ = group B versus group C.

Table 2. Obstetric history of the studied groups.

Characteristic	Study group (n = 348)			Test <i>f</i>	<i>P</i> value	Post hoc
	Group A (n = 116)	Group B (n = 116)	Group C (n = 116)			
Parity	2.06 ± 1.32	2.18 ± 1.35	2 ± 1.09	0.623	0.537	<i>P</i> ₁ = 0.465 <i>P</i> ₂ = 0.715 <i>P</i> ₃ = 0.274
Mean ± SD	(0–7)	(0–7)	(1–6)			
Obstetric Hx (GA wks.)	38.22 ± 1.25	38.45 ± 1.15	38.15 ± 1.32	1.842	0.160	<i>P</i> ₁ = 0.171 <i>P</i> ₂ = 0.635 <i>P</i> ₃ = 0.065
Mean ± SD	(34–41)	(34–41)	(35–41)			
Estimated fetal weight (EFW) (kg)	3.23 ± 0.29	3.24 ± 0.27	3.2 ± 0.3	0.614	0.542	<i>P</i> ₁ = 0.800 <i>P</i> ₂ = 0.420 <i>P</i> ₃ = 0.289
Mean ± SD	(2.4–3.8)	(2.4–3.9)	(2.4–3.8)			
Category	Number (%)	Number (%)	Number (%)	χ^2	<i>P</i> value	
Previous contraception						
IUCD	37 (31.9)	36 (31)	34 (29.3)			
Hormonal	53 (45.7)	62 (53.4)	56 (48.3)	3.090	0.797	
no	16 (13.8)	10 (8.6)	17 (14.7)			
Barrier	10 (8.6)	8 (6.9)	9 (7.8)			

(*f*) = one way analysis of variance test, (χ^2) = chi-square tests.

Post Hoc Tests: *P*₁ = group A versus group B; *P*₂ = group A versus group C; *P*₃ = group B versus group C.

This table shows that there was statistically significant difference between the studied groups regarding weight where cases in group A showed higher weight than other 2 groups followed by group B then group C. on the other hand there was no statistically significant difference between the studied groups regarding age, height, medical and surgical history Table 2.

This table shows that among the study groups, there was not no statistically significant variance in the same level, EFW, obstetric history, or recent contraception Table 3.

As can be seen from this table, there was no statistically significant variation in the analysed groups' rates of IUCD expulsion at 1-week, 6-week, and 6-month intervals Table 4.

Table 3. The rate of expulsion among the studied groups.

Characteristic	Study group (n = 348)			test	P value
	Group A (n = 116)	Group B (n = 116)	Group C (n = 116)		
Category	Number (%)	Number (%)	Number (%)	χ^2	
1 Week					
No	116 (100)	116 (100)	116 (100)	–	–
6 Weeks					
Yes	0	1 (0.9)	0	2.006	0.367
No	116 (100)	115 (99.1)	116 (100)		
6 Months					
Displaced	1 (0.9)	1 (0.9)	0		
Expulsion	2 (1.7)	4 (3.4)	2 (1.7)	2.041	0.728
No	113 (97.4)	111 (95.7)	114 (98.3)		

(χ^2) = chi-square tests.

This table indicates that while there was no statistically significant difference in the VAS score between the studied groups, there was a statistically significant difference in the type of pain experienced by the groups. Specifically, 37.1% of cases in group A reported cramps, followed by cases in group B (22.4%) and cases in group C (21.6%). About 10.3% of cases in group C, 7.8% of cases in group B, and 3.4% of cases in group A had colicky pain Table 5.

This table shows that the quantity of pads, blood clots, and bleeding pattern did not differ statistically significantly across the study groups Table 6.

This table illustrates the statistically significant differences in postpartum bleeding amongst the examined groups with respect to Lochia. Group A

Table 4. Visual analogue scale score and pain characteristics among the studied groups.

Characteristic	Study group (n = 348)			test	P value	Post hoc
	Group A (n = 116)	Group B (n = 116)	Group C (n = 116)			
Category	Number (%)	Number (%)	Number (%)	χ^2	P value	
VAS	0.56 ± 0.77	0.52 ± 0.89	0.61 ± 1.03	0.321	0.726	P1 = 0.716 P2 = 0.663 P3 = 0.424
Mean ± SD	(0–3)	(0–4)	(0–4)			
Type of Pain						
no	69 (59.5)	81 (70)	79 (68.1)			
Cramps	43 (37.1)	26 (22.4)	25 (21.6)	11.535	0.021*	
Colicky	4 (3.4)	9 (7.8)	12 (10.3)			

(f) = one way - Analysis of Variance test, (χ^2) = chi-square tests.

Post Hoc Tests: P1 = group A versus group B; P2 = group A versus group C; P3 = group B versus group C.

Table 5. Bleeding characteristics among the studied groups.

Characteristic	Study group (n = 348)			Test f	P value	Post hoc
	Group A (n = 116)	Group B (n = 116)	Group C (n = 116)			
Category	Number (%)	Number (%)	Number (%)	χ^2	P value	
No of Pads	3.49 ± 0.89	3.39 ± 0.82	3.41 ± 0.64	0.444	0.642	P1 = 0.367 P2 = 0.495 P3 = 0.828
Mean ± SD	(2–6)	(2–6)	(3–6)			
Pattern						
Normal	57 (49.1)	59 (50.9)	57 (49.1)			
Mild	32 (27.6)	30 (25.9)	27 (23.3)			
Moderate	5 (4.3)	6 (5.2)	10 (8.6)	5.932	0.821	
Heavy	4 (3.4)	3 (2.6)	1 (0.9)			
LA	18 (15.5)	18 (15.5)	21 (18.1)			
Blood Clots						
No	111 (95.7)	114 (98.3)	115 (99.1)	3.326	0.190	
Yes	5 (4.3)	2 (1.7)	1 (0.9)			

(f) = one way analysis of variance test, (χ^2) = chi-square tests.

Post Hoc Tests: P1 = group A versus group B; P2 = group A versus group C; P3 = group B versus group C.

Table 6. Lochia (postpartum bleeding) among the studied groups.

Characteristic	Study group (n = 348)			test	P value	Post hoc
	Group A (n = 116)	Group B (n = 116)	Group C (n = 116)			
Number of days	28.46 ± 5.34	27.37 ± 5.15	25.06 ± 4.42	13.951	<0.001*	P1 = 0.102 P2<0.001* P3 = 0.001*
Mean ± SD	(20–42)	(20–42)	(21–42)			

(f) = one way analysis of variance test.

Post Hoc Tests: P1 = group A versus group B; P2 = group A versus group C; P3 = group B versus group C.

had the highest mean value, followed by groups B and C. While there was a statistically significant difference between groups A and C as well as between groups C and B, there was a statistically non-significant difference in the Lochia mean value between group A and group B.

4. Discussion

The current study showed that all women have a similar mean age; 28.36 years in group (A), 28.29 years in group (B), 27.19 years in group (C) and the age difference between three studied groups was not significant.

This finding is in line with that of Mahmoud *et al.*⁸ Our study found that participants' mean age was 29.17 ± 4.56 years, there was no significant age difference between the fixation, and nonfixation groups.

This is similar to the average age found in earlier research, which was 30 years in Levi *et al.*⁹ study, for the TCU-380A group, 28.7 years in Ragab *et al.* study.¹⁰

Nonetheless, individuals with lower mean ages—such as 24.9 years in other studies—were included in Jakhar *et al.*¹¹ Study, and 23.12 years in Singal *et al.* study.¹² The discrepancies in inclusion criteria between research may be the cause of the discrepancy in the mean ages of the participants.

The current study discovered that there was no statistically significant difference between the studied groups regarding parity, but there was a statistically significant difference between the studied groups regarding previous caesarean sections, with cases in group (B) showing a higher mean previous caesarean section than the other two groups, followed by group (A) then group (C).

Regarding the rate of expulsion of IUCD at intervals of one week, six weeks, and six months, there was no statistically significant difference between the tested groups. Six months later, group (A) had one displaced person and two expelled people, group (B) had two displaced people and two expelled people, and group (C) had two displaced people and one expelled person.

This was in accordance with Abdel-Ghany *et al.*¹³ who found that there was no discernible difference in the IUD displacement and expulsion rates between the two study groups. Immediate postpartum IUD insertion is a feasible option, as evidenced by its widespread use in various nations, including Egypt, China, and Mexico. Numerous benefits of this strategy include relaxation, confirmation that the woman is not expecting, as well as increased motivation. It's critical to follow up early to identify spontaneous IUD expulsion.

On the contrary, Eroglu *et al.*¹⁴ evaluated the hazards and benefits of interval, early postpartum, and immediate post-placental IUD insertions. They revealed that compared with the interval IUD implantation group, the immediate post-placental and early postpartum insertion groups displayed more problems and higher expulsion rates.

Similarly, a meta-analysis conducted by Lopez *et al.*¹⁵ showed that the immediate postplacental IUD group had a higher likelihood of having an IUD expelled within six months.

The administration method, IUD type, and insertion time are some of the variables that influence the pace at which IUCDs expel after being inserted. One significant deciding element can be the operator's experience. It has also been proposed that parity influences expulsion. Furthermore, the chances of ejection may rise as a result of the physiological and anatomical changes that take place during the puerperium. The chance of ejection may be increased by prolonged cervical dilatation brought on by extensive lochia passage, uterine subinvolution, and severe contractions.

The cervix is typically not fully dilated after cesarean birth, which makes IUD ejection into the cervical canal more difficult. This may account for the discrepancy in IUD expulsion rates between vaginal and cesarean deliveries. Furthermore, following placenta evacuation, it should be theoretically simpler to obtain adequate fundal location of the IUD because the entire uterus is readily visible, palpable, and checked during cesarean birth.

Our current findings unmistakably showed that there was no statistically significant difference in the VAS score between the studied groups, but there was a statistically significant difference in the type of pain experienced by the groups, with cramps being reported by 37.1% of cases in group A, followed by cases in group B (22.4%), and cases in group C (21.6%). About 10.3% of cases in group C, 7.8% of cases in group B, and 3.4% of cases in group A had colicky pain.

These results were compatible with Thiam *et al.*¹⁶ who said that patients who use IUDs complain about uterine cramps very frequently. They make up the second reason for giving up on the approach. At the first medical assessment (M1), 11.8% of the women that benefited from the per-caesarean placement reported feeling uncomfortable, compared with 25% for the immediate postpartum insertion. During the second medical check (M3), the rate had significantly increased, with 32% and 46.6% of cases being caesarean sections and instances occurring immediately after childbirth,

respectively. But on the third medical check, the rate significantly dropped (M6).

According to the current investigation, there was no statistically significant difference in the number of pads, blood clots, or bleeding pattern between the groups under examination. Menorrhagia and dysmenorrhea are the copper IUD's most frequent side effects.

Hubacher *et al.*¹⁷ revealed that these symptoms were reported by 53% of women. None of them, however, indicated that they were dissatisfied with the IUD in general or that they had chosen to have it removed.

Abdel-Ghany *et al.*¹³ showed that there was no discernible difference in post-insertion discomfort or hemorrhage between the two groups.

There was no statistically significant difference between the groups under study in terms of pelvic infection. Consistent with our findings, Mahmoud *et al.*⁸ revealed that five individuals had pelvic infections, and there were no statistically significant differences between the groups under investigation. Similarly, 2.3% of people had PID in Singal *et al.*¹² study and 3% in Ragab *et al.* (2015)¹⁰ study.

In the same context, Çelen *et al.*¹⁸ examined the safety and efficacy of putting the Cu T 380A IUCD in immediately after the placenta is expelled after a cesarean delivery. The primary outcome markers were the 12-month cumulative incidences of medically associated IUCD issues, IUCD ejection, and unintended conception. Consistent with our findings, they demonstrated that IUCD implantation immediately following placental ejection provides adequate pregnancy protection without raising the risk of infection.

4.1. Conclusion

Compared with nonfixed IUCD, copper IUCD (TCu-380A), which was introduced right after the placenta was expelled during lower segment CS, had superior efficacy, safety, and convenience. The least amount of expulsion and the best overall health outcomes across all research points were obtained with IUCD insertion and fixation using absorbable suture (Hang up method).

4.2. Recommendation

It should be standard procedure to provide eligible expectant moms scheduled for elective cesarean sections with intraoperative IUCD placement services. Prenatal education ought to raise awareness of IUCD and its safety during intraoperative insertion. To boost IUCD use, the ministry of health

should create guidelines for creative implementation. Further research is needed to assess the relative risk of these problems.

Conflicts of interest

No conflict of interest.

References

- Hounton S, Winfrey W, Barros AJ, et al. Patterns and trends of postpartum family planning in Ethiopia, Malawi, and Nigeria: evidence of missed opportunities for integration. *Glob Health Action*. 2015;8:29738.
- Guttmacher Institute. *Adding it up*. New York, NY: Investing in Contraception and Maternal and Newborn Health. 2017.
- Gestational hypertension and preeclampsia. ACOG practice bulletin, number 222. *Obstet Gynecol*. 2020;135:e237–e260.
- Tjahjanto H, Haryuni IT. Hang-up IUD, new technique for suturing CuT-380A to the fundus in immediate postplacental insertion during cesarean delivery: twelve months follow up. *Indones J Obstet Gynecol*. 2014;31:132–139.
- Gradysewska A, Niewiadomska-Kowalczyk M, Szmańska B, et al. Extraterine mislocated IUD. *Ginekol Pol*. 2009;80:942–945.
- Ozgun MT, Batukan C, Serin IS, et al. Surgical management of intra-abdominal mislocated intrauterine devices. *Contraception*. 2007;75:96–100.
- Kapp N, Curtis KM. Intrauterine Device Insertion during the Postpartum Period: A Systematic Review *Contraception*. vol. 80. 2009;327–336.
- Mahmoud MAA, Elkhatatny HH, Abd Elhalim AEM. IUCD insertion and fixation versus insertion only during cesarean section. *Al-Azhar Int Med J*. 2022;3:30–35.
- Levi E, Cantillo E, Ades V, et al. Immediate postplacental IUD insertion at cesarean delivery: a prospective cohort study. *Contraception*. 2012;86:102–105.
- Ragab A, Hamed HO, Alsammani MA, et al. Expulsion of Nova-T380, multiloop 375, and copper-T380A contraceptive devices inserted during cesarean delivery. *Int J Gynecol Obstet*. 2015;130:174–178.
- Jakhar R, Singhal G. Safety and efficacy of intra-caesarean IUCD: a prospective study at a tertiary care centre. *J Obstet Gynaecol India*. 2019;69:325–329.
- Singal S, Bharti R, Dewan R, et al. Clinical outcome of post-placental copper T 380A insertion in women delivering by caesarean section. *J Clin Diagn Res: J Clin Diagn Res*. 2014;8:OC01.
- Abdel-Ghany A, Khalifa E, El-Din MZ, et al. Intrapartum versus postpartum insertion of intrauterine device in women delivering by cesarean section. *BMC Pregnancy Childbirth*. 2022;22:365.
- Eroğlu K, Akkuzu G, Vural G, et al. Comparison of efficacy and complications of IUD insertion in immediate post-placental/early postpartum period with interval period: 1 year follow-up. *Contraception*. 2006;74:376–381.
- Lopez LM, Bernholz A, Hubacher D, et al. Immediate postpartum insertion of intrauterine device for contraception. *Cochrane Database Syst Rev*. 2015;6:CD003036.
- Thiam O, Cissé ML, Ndiaye P, et al. The Intrauterine Device (IUD) of the immediate postpartum a comparative study between the caesarean IUD and the IUD inserted after a natural delivery. *Clin Obstet. Gynecol Reprod Med*. 2015;1:87–92.
- Hubacher D, Chen PL, Park S. Side effects from the copper IUD: do they decrease over time? *Contraception*. 2009;79:356–362.
- Çelen Ş, Sucak A, Yıldız Y, et al. Immediate postplacental insertion of an intrauterine contraceptive device during cesarean section. *Contraception*. 2011;84:240–243.