

Association of the Position of the Copper T 380A as Determined by the Ultrasonography Following its Insertion in the Immediate Postpartum Period with the Subsequent Complications: An Observational Study

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Abstract

Purpose Incorrectly placed copper T 380A leads to increased contraception failure. This study aimed to find an association between the ultrasonographic position of the copper T 380A in the immediate postpartum period and the adverse effects observed during the period of 6 months after its insertion.

Methods This descriptive study was carried out in the Department of Obstetrics & Gynaecology of a tertiary-care-center of India from September 2011 to February 2013. The women eligible for immediate postpartum copper T 380A insertion with previous regular menstrual cycles for at least 6 months before the current pregnancy, and those who were willing for follow-up visits and had easy accessibility to the hospital, were recruited. A clinical evaluation and

ultrasonographic assessment of Intra-Uterine-Contraceptive-Device (IUCD) after insertion was carried out after enrolment. The complications (expulsions, vaginal discharge, menstrual irregularity, and lower abdominal pain) were subsequently assessed during a 6-month follow-up period. The primary objective was the ultrasonographic assessment of the placement of IUCD immediately after insertion. The incidence of complications and their association with the presence of malposition was also studied.

Results Hundred patients were evaluated during the study period. Forty-four (44 %) women were found to have malpositioned IUCDs on ultrasonographic evaluation done following insertion. The complications among the IUCD users included menstrual irregularity (27.17 %), pain in lower abdomen (20.65 %), vaginal discharge (7.6 %), and expulsions (9.7 %). The IUCD expulsions, menstrual irregularities, and pain were significantly more in patients with malpositions ($p < 0.05$).

Conclusions Malpositioning of IUCD is common immediately following insertion and is significantly associated with more complications during the follow-up.

Keywords IUCD · Malposition · Expulsion · Menstrual irregularity · Contraception

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Introduction

The population of India stands at 121 crore (census 2011). Curbing this alarming rise in population is of immediate

concern for the health policy makers. The provision of an effective contraception with minimal adverse effects is essential in achieving the goals related to the population control.

Intra-uterine Contraceptive Devices (IUCDs) are being used by an estimated 100 million women. Around 13 % of couples use an IUCD, more in the developing world than in the developed ones [1]. Incorrectly placed copper T 380A leads to increased chances of the failure of contraception. Many studies have explored the association between the position of the IUCD, its subsequent expulsion rate, and its side effects like menstrual irregularities and lower abdominal pain [2–6].

At present, the clinical examination is routinely used to assess the IUCD position. In case of the nonvisibility of the IUCD strings, imaging modalities like ultrasonography, X-rays, MRI, and CT-scan are quiet helpful [7–9].

The present study aimed to find an association between the position of the copper T 380A as determined by 2D-ultrasonography and any adverse effects observed due to the copper T 380A use during the period of 6 months after its insertion was done in the immediate postpartum period.

Methods

This study was carried out in the Department of Obstetrics and Gynaecology of a tertiary-care-center of northern India from September 2011 to February 2013. Women eligible for immediate postpartum copper T 380A insertion as per WHO Medical Eligibility Criteria (MEC) 1 and 2 [10, 11], with previous regular menstrual cycles for at least 6 months before the current pregnancy, and those who were willing for follow-up visits and had easy accessibility to the hospital were recruited. They were followed up after 6 weeks and 6 months from the day of the insertion. This study was approved by the ethical committee of the institute and a written informed consent was taken from the women enrolled.

Women having normal vaginal delivery underwent IUCD insertion by standardized technique using Kelly's placental forceps or manual technique. Women undergoing cesarean section had IUCD insertion manually immediately after removal of the placenta.

At the time of enrollment, after taking written informed consent from the patients, the clinical details of the patients were collected as per a predesigned proforma. This was followed by ultrasonographic examination using transabdominal USG (Toshiba SSA-320A) and sector curvilinear transducer (Toshiba PVG-366 m, 3.75 MHZ). The position of the IUCD was assessed.

On the basis of the position and distance measured from the fundus, the malpositioning of the IUCDs was further labeled as *midcavity placement*: IUCD was placed linearly

in midline with the distance from the fundus measured to be more than 15 mm; *lateralized placements*: Fundally placed upright IUCDs with appropriate distance from the fundus not in the midline, *lower segment placements*: Linearly placed IUCDs lying visibly in the lower segment of the uterine cavity; and *oblique or inverted placements*: IUCDs lying anywhere in the cavity which were visibly oblique or inversely placed.

At 6-week and 6-month follow-up visits, history and clinical examination were repeated as per the predesigned proforma. Also, patients were told to report back in case of any complaints such as severe pain, missed period, heavy periods, irregular bleeding and discharge. In case of expulsion of the copper T 380A, another contraceptive method was offered or copper T was re-inserted.

Statistical Analysis

Summary statistics were calculated for the baseline characteristics. The frequencies of IUCD malposition, complication rates and adverse effects were reported in percentages. The continuous variables were compared using 't-test' for normally distributed data. The skewed data were analyzed by Wilcoxon rank-sum test. The categorical data were analyzed using χ^2 test and Fischer's exact test. *p* value less than 0.05 was taken as statistically significant. The data were analyzed using STATA 9.0.

Results

One-hundred-and-thirty-two patients undergoing copper T 380A insertion in immediate postpartum period were screened for enrollment in the study. Out of them, 32 patients refused consent for enrollment. Thus, in total, 100 patients were studied. Fifty-one patients had copper T 380A insertion after normal vaginal delivery, and 49 patients had insertion during the Cesarean section. Out of 51 patients undergoing IUCD insertion after normal vaginal delivery, 41 women had IUCD inserted by Kelly's long placental forceps, and 10 had IUCD inserted by manual technique. The baseline characteristics of the study population are summarized in Table 1. At the end of the study period, the total number of women lost to follow-up was eight (four women at 6 weeks and four women at 6 months).

On ultrasonographic evaluation done following IUCD insertion, 44/100 (44 %) women were found to have misplaced IUCDs. Out of the 44 malpositions identified, 24 were mid-cavity placements, 9 were lateralized placements, 4 were inverted or oblique placements and 7 were lower uterine segment placements. The malpositions were significantly more common after IUCD insertion following

Table 1 Baseline characteristics of the study participants

Baseline characteristics	<i>N</i> = 100
Mean age in years; (SD, Range)	25.21 (3.41, 18–35)
Education (%)	
Illiterate ^a	44
Primary school	14
Middle school	16
Secondary school	17
Graduate	9
Occupation (%)	
Working	13
Housewife	87
Married for (years) Median [IQR]	6 [4–7.5]
Pregnancy confirmed by (%)	
UPT	58
USG	31
Clinical examination	11
Median no. of previous pregnancies [IQR]	2 [1, 2]
Previous D&E (%)	
Yes	11
No	89
Contraceptive history (%)	
Nil	90
Copper T	6
Others	4
Medical history (%)	
Significant ^b	7
Non significant	93

UPT urine pregnancy test, *USG* ultrasonography, *IQR* inter quartile range, *D & E* dilatation and evacuation

^a Including those who can sign their names but cannot read and write

^b Heart disease, pulmonary tuberculosis, epilepsy, hypertension, hypothyroidism, diabetes mellitus

vaginal delivery compared to that during the cesarean section (30/51 vs. 14/49 %; $p = 0.002$).

The complications among the IUCD users in the study population included menstrual irregularity (25/92; 27.17 %), pain in lower abdomen (19/92; 20.65 %), vaginal discharge (7/92; 7.6 %), and expulsions (9/92; 9.7 %). No perforation or pregnancy was observed.

Table 2 shows the frequencies of the complications and the adverse effects of the copper T 380A in relation to the malposition as assessed by ultrasound. The IUCD expulsions, menstrual irregularities, and pain were significantly more in patients with malpositions ($p < 0.05$).

All expulsions were seen within the first 6 weeks of the insertion of the IUCD. All the expulsions recorded were in the post-vaginal delivery group. 8/9 patients with expulsions had malpositioned IUD at the baseline ultrasonographically. The maximum expulsions were seen for the

Table 2 Frequencies of the complications and the adverse effects of the copper T 380A in relation to the malposition of the copper T 380A

Complications observed	Malposition present	Malposition absent	<i>p</i> value
Expulsions	8	1	0.01*
Vaginal discharge	3	4	0.84
Menstrual irregularity	19	6	0.03*
Lower abdominal pain	13	6	0.01*

*Statistically significant

oblique/inverted placements of the IUCDs (50 %) followed by lower uterine placements (42.8 %) and mid-cavity placements (12.5 %). No expulsion was seen for the lateralized placement of the IUCDs (Table 3).

Discussion

The aim of the study was to correlate the position of the IUCD in the uterine cavity in the immediate postpartum period to the expulsion rate and other adverse effects observed over a period of 6 months. Studies [2, 7, 8, 12] have been done in the past to identify the misplaced IUCDs by different imaging modalities irrespective of the time and method of insertion, but there is no study in the literature, describing the correct position of the IUCDs in terms of the ultrasonographic parameters in the immediate postpartum period. This study was done to identify the malpositioned IUCDs by sonography done within 24 h of the insertion of the IUCD and explore its association with the side effects observed after 6 months of follow up. Identification of any type of malposition of the IUCD, before the patient is discharged, would help in screening out the high-risk patients, and an option of re-insertion of IUCD could be offered. In the present study, we could identify misplacement of the IUCD among 44 women, as per the predefined parameters. There is a paucity of studies describing the exact frequency of the malpositioned IUCD observed in the immediate postpartum period. Out of all types of the malpositions observed, we found that lateralized placements were associated with no side effects; thus, we conclude that IUCDs found to be placed lateralized in the uterine cavity are of least concern to the patient and the caregiver. On the other hand, inverted or obliquely placed IUCDs were found to be associated with maximum number of the side effects and it should be followed up stringently. Rate of malposition seen was more after normal vaginal delivery than the intra c-section placement of the IUCDs [30 (68.2 %) vs. 14 (31.8 %); p value < 0.0001], which is comparable with the studies done previously [12–15] No statistically significant difference was seen with regard to the method of insertion (Kelly vs. manual) [p value 0.5]

Table 3 Distribution of complication and adverse effects with respect to types of malposition in post partum group

Total malpositions (44)	Total	Expulsion	Vaginal discharge	Lower abdominal pain	Menstrual irregularities			
					A	B	C	Total
Midcavity placement	24	3	3	7	7	1	2	10
Lower uterine segment placement	7	3	0	3	2	3	0	5
Inverted/oblique placement	4	2	0	3	2	2	0	4
Lateralized placement	7	0	0	0	0	0	0	0
Correctly placed	56	1	4	6	2	3	1	6
Total	10	9	7	19	13	9	3	25

A menorrhagia, B metrorrhagia, C menometrorrhagia

Table 4 Expulsion rate of immediate post partum IUCDs

Studies	Eroglu et al. [19]	Celen et al. [18]	Present study (2013)
No. of cases	84	235	100
Expulsion rate	14.3 % (after 1 year)	12.3 % (after 1 year)	9 % (after 6 months)

[16]. The most common complaint among the IUCD users in the study population was of menstrual irregularity (27.71 %) followed by pain in lower abdomen (20.65 %), expulsion (9.78 %), and vaginal discharge (7.60 %). No case of perforation or pregnancy was reported. Results obtained are in accordance with the previous studies [17–19].

Statistically significant association was found with the side effects like expulsion, menstrual irregularity and pain, and the position of the IUCD in the cavity which has also been shown by the previous studies [20, 21] (Table 4).

The number of correct placements could be used as an indicator of personnel training. Regular training of the personnel with audit may help in reducing the number of malpositions, reduce the complication rate, and thus increase the acceptance of the IUCD.

The limitations of the study included small sample size and shorter follow-up period.

Conclusion

The clinical examination has its limitations in the assessment of the IUCD position especially in postpartum IUCDs as the threads remain coiled inside the uterus in postcesarean state. Thus, sonography can be used as an adjunct to clinical examination to examine the position of the IUCD. The removal and re-insertion can be offered in patients with malpositioned IUCDs. Alternatively, these

patients could be closely followed up for early detection and prompt management of any complication.

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Conflicts of interest None.

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