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Research Article

A Prospective Observational Study to Correlate Ultrasound Guided Detection of Position of Postpartum Intra-Uterine Contraceptive Device and Its Relation to Complications

[1]Dr. Swati Kochar, [2]Dr. Suman Kanwar*, [3]Dr. Shweta Chaudhary, [4]Dr. Moomal Chaudhary, [5]Dr. Manisha Kumawat

[1]Senior Professor, [2,3,5]Junior Resident – 3, [4]Asso. Professor,
Department of Obstetrics and Gynecology, Sardar Patel Medical College and Associated Groups of Hospitals, Bikaner Rajasthan.

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Corresponding author: Dr. Suman Kanwar
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Abstract

Introduction: Proper positioning of postpartum intrauterine contraceptive device (PPIUCD) is of utmost importance for efficacy and safety. The present study aimed to find the position of PPIUCD by ultrasonography and correlate the adverse effect and complication rate with location of IUCD.

Methods: This study was carried out in the Department of Obstetrics and Gynaecology of a tertiary-care-center of northern India from May 2021 to May 2022. The study group enrolled women who opted for PPIUCD after normal delivery or caesarean section and ready for follow up routinely after 6 weeks and 3 months. A clinical evaluation and Ultrasonographic (USG) examination was done on day 3 and on follow up visits (6 weeks & 3 months) for confirmation of IUCD position either at normal position or malposition. Women asked to report back in case of missing thread or missed period, abnormal bleeding, any discharge per vaginum, severe pain.

Result: 130 patients (65 in each group) were evaluated during study time. Majority of cases in both normal delivery (73.85%) and cesarean section (95.38%) were correctly placed. Most common malposition was midcavity (10%) cases and least common was oblique (1.53%). Continuation was higher in cesarean section (96.92%) at 6 weeks and (98.41%) at 3 months than normal delivery (95.38%) at 6 weeks and (98.41%) at 3 months. Complaints was reported relatively more in normal delivery cases then in cesarean section.

Conclusion: USG helps in determining, whether PPIUCDs are placed in normal position or malposition. Correct placement of PPIUCD is important to reduce the incidence of expulsion.

Keywords: PPIUCD, USG, Malposition, Expulsion

Introduction

Family planning can avert nearly one third of maternal deaths and 10% of child mortality when couple space their pregnancies more than two years apart. The intrauterine device (IUD) is the most popular reversible form of contraception today, with more than 168 million users worldwide[1]. Globally, IUCD is the second most popular contraceptive method after female sterilization accounting for 13.7% of modern contraceptive prevalence rate.

PPIUIUD is a good contraceptive method with failure rate of 0.6 to 0.8/100 women year of first year use and also good for lactating women because it has no effect on the quantity or composition of breast milk.[2]Copper T380A, is an effective contraceptive with pregnancy rate of 0.6

to 0.8 /100 women year of first year of use. Copper 380A IUD provides effective contraception for 10 years.[3]

Imaging plays a crucial role in the management of patients with IUDs.[4] Ultrasonography is the most common initial method of evaluation due to its cost-effectiveness, lack of ionizing radiation, and greater detail of pelvic anatomy. helpful adjunctive modality given their larger field of view.[5] Incorrectly placed IUCDs leads to increased chances of the failure of contraception.[6] Proper positioning of Copper containing IUCD is of utmost importance for efficacy and safety.[7]

There is a paucity of studies describing the exact frequency of the mal-positioned IUCD observed in the postpartum period. The present study aimed to find the position of IUCD by ultrasonography and correlate the adverse effect and complication rate with location of IUCD.

Materials and Methods

This study was carried out in the Department of Obstetrics and Gynaecology of a tertiary-care-center of northern India from May 2021 to May 2022. The study group comprised of females who opted for PPIUCD within 48 hours of delivery and no contraindication for PPIUCD as per WHO Medical Eligibility Criteria (MEC), 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 3 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. Pregnant women who did not fulfil World Health Organization medical eligibility criteria for IUCD insertion like those, fever during labour and delivery, delivering at less than 28 weeks and with PROM more than 18 hours, who had a previous history of genital tuberculosis, known allergy to copper, history of uterine abnormalities and not willing to participate were excluded from the study.

- IUCD was inserted immediately after delivery of the placenta following a vaginal delivery or caesarean section. Ultrasonographic (USG) examination was done on day 3, of normal delivery or cesaerean section. Women who accepted PPIUCD insertion were advised to follow up routinely after six weeks and three months on an outpatient basis. On follow up visits, the position of IUCD was also verified by USG examination. Distance was measured by USG from fundus to midpoint of horizontal limb of Cu T380A. The normal position of IUCD is defined as IUCD placed linearly in midline in the uterine cavity. The malpositioning of the IUCD was further labelled as Midcavity placement: placed linearly in midline with Fundus measured to be more than 15 mm, Lateralised placement: Fundally placed upright IUCD with appropriate Distance from fundus not in midline, Lower segment placement: Linearly placed IUCD lying visible in lower uterine segment, Oblique or inverted placement: IUCD lying anywhere in the cavity which Were visibly oblique or inversely placed. Women asked to report back in case of missing thread or missed period, abnormal bleeding, any discharge per vaginum, severe pain. Follow up visits were done at 6 weeks and 3 months and women were evaluated for Expulsion of IUCD by history, examination or USG.

Statistical analysis

Data was entered in Microsoft excel spreadsheet and analysed by SPSS Statistical software version 16.0. Qualitative data were presented as percentages and proportions. Quantitative data was presented as mean and standard deviation. Chi square test was employed for significance of association. For statistical significance, a value of <0.05 was considered.

Result

Total one hundred thirty patients undergoing PPIUCD were enrolled for this study. Out of 65 patients undergoing IUCD insertion after normal vaginal delivery and 65 patients after cesarean section delivery. Total number of women lost to follow up was four at the end of study (two after 6 weeks in cesarean delivery group and two after 3 months in normal delivery group).

The baseline characteristics of the study population are summarized in Table 1. Ultrasonography was done to confirm position of IUCD after 48 hours in which position of IUCD in uterus in majority of cases in both normal delivery (73.85%) and cesarean section (95.38%) were correctly placed. Mid cavity placement was much more in normal delivery (16.92%) in comparison of caesarean section (3.07%) (P-value 0.014). Location of IUCD <10mm from fundus by USG was found in normal delivery (64.62%) and cesarean section (95.38%) and ≥10mm was much greater in normal delivery (35.38%) in comparison of caesarean section (4.62%) (P-value <0.0001). (Table no 2)

At 6 week follow up, IUCD location at <10mm was 96.82% in cesarean section and 66.13% in normal delivery. At 3 month follow up, IUCD location at <10mm was 98.38% in cesarean section and 64.70% in normal delivery. (P-value <0.0001).

Continuation was higher in cesarean section at 6 week (96.92%) and at 3 months (98.41%) than normal delivery at 6 weeks (95.38%) and at 3 months (98.41%) follow up. (P-value 0.0042).

A complaint was reported relatively more in normal delivery cases then in cesarean section cases. There is statistically significantly lower complaints (BPV, discharge, missing strings and pain abdomen) at 6 weeks and 3 months in normal delivery and caesarean delivery having PPIUCD location is <10 mm as compared to ≥10mm (P-value<0.05). Table no 3A &3B

At 6 weeks no expulsion was found <10mm IUCD fundal position in both normal delivery and cesarean delivery group. Expulsion of IUCD was found of ≥10mm IUCD location only 3 cases in normal delivery (P-value 0.013) and 2 cases in caesarean delivery (P-value 1.0).

At 3 months Expulsion of IUCD location <10mm was found in normal delivery much lesser (1 case) than ≥10mm IUCD location (4 cases) (P-value 0.027). In cases of cesarean section, no expulsion is found at 3 months, although there is 1 case having location of PPIUCD is ≥10mm (P-value 1.0). (Table no 4).

Table 1: Baseline characteristics of the study participants

Baseline charactereristics	N = 130
Age	26.23 (3.57, 18-35)
Education (%)	
Illiterate	10 (7.69%)
Literate	120 (92.31%)
Residence (%)	
Rural	59 (45.38%)
Urban	71 (54.62%)
Religion (%)	
Hindu	110 (84.62%)
Muslim	14 (10.77%)
Other	6 (4.62%)
Socioeconomic class (%)	
Lower class	15 (11.53%)
Upper lower class	24 (18.46%)
Lower middle class	54 (41.53%)
Upper middle class	26 (20%)
Upper class	11 (8.46%)
Parity (%)	
P1	80 (61.54%)
P2	37 (28.46%)
≥P3	13 (10%)

Table No. 2: Distribution of cases according to position of IUCD in uterus by USG :-

Location of IUCD by USG	Normal delivery		Cesarean Section	
	N	Percentage	N	Percentage
Mid cavity placement	11	16.92	2	3.07
Lower uterine segment	2	3.07	0	0
Lateral Placement	2	3.07	1	1.53
Oblique Placement	2	3.07	0	0
Correctly placed	48	73.84	62	95.38
IUCD-FUNDAL distance				
<10 mm	42	64.62	62	95.38
≥10mm	23	35.38	3	4.62

Table No. 3A: Complain at 6 weeks follow up

Complain	Location by USG					
	Normal Delivery		P-value	Caesarean Section		P-value
	<10mm (N=41)	≥10mm (N=21)		<10mm (N=61)	≥10mm (N=2)	
BPV	5 (12.2%)	9 (42.86%)	0.0067	3 (4.92%)	1 (50%)	0.0107
Discharge PV	4 (9.76%)	7 (14.29%)	0.026	3 (4.92%)	0(0%)	0
Expelled	0 (0%)	3 (14.29%)	0.0138	0(0%)	0(0%)	0
Missing String	0 (0%)	3 (14.29%)	0.0138	4 (6.56%)	1 (50%)	0.0107
Pain Abdomen	6 (14.63%)	11 (52.38%)	0.0002	5(8.19%)	1 (50%)	0.0017

Table No. 3B: Complaints at 3 months follow up

	Location by USG					
	Normal Delivery		P-value	Caesarean Section		P-value
	<10mm (N=33)	≥10mm (N=18)		<10mm (N=61)	≥10mm (N=1)	
BPV	3 (9.09%)	5 (27.78%)	0.082	2 (3.28%)	0 (0%)	0.855
Discharge PV	4 (12.12%)	8 (44.44%)	0.01	3 (4.92%)	0 (0%)	0.826
Expelled	1 (3.03%)	4 (22.22%)	0.029	0 (0%)	0 (0%)	0
Missing strings	1 (3.03%)	3 (16.67%)	0.086	5 (8.20%)	1 (100%)	0.0023

Table No. 4: Association of Expulsion with IUCD-Fundus distance at 6 weeks

Location by USG		Expulsion at 6 weeks			Expulsion at 3 months			
		Normal Delivery	Cesarean Section		Normal Delivery		Cesarean section	
	No	Yes	No	Yes	No	Yes	No	Yes
<10mm	41	0	61	0	32	1	61	0
≥10mm	18	3	2	0	14	4	1	0
Total	59	3	63	0	46	5	62	0
P-value		0.013			0.027		1.0	

Discussion

This prospective hospital-based study was conducted on 130 parturients (65 Normal vaginal deliveries & 65 cesarean section delivery) who were accepted and opted PPIUCD at a tertiary Care centre with around 15,000-20,000 deliveries per year and is the main referral centre for North-western Rajasthan. PPIUCD insertion is a very effective and most accepted Long-Acting Reversible Contraceptive method now

days. It is known that it has very high efficacy and good safety profile, but at the same time efficacy, safety and complications, all depends on whether it is properly inserted in normal position or not. Position can accurately be determined only by various types of clinical and radiological evaluation.[8] This study was done for ultrasonographic assessment of correct placement of PPIUD and its correlation with clinical outcome after 6 weeks and 3 months of follow up.

In our study mean age of cases was 26.23±3.57 years with majority of cases belong to age group 21-25 year (50.00%) while least common age group was 31-35 year (2.31%). Here, we had found that majority of cases (80) were primipara (61.54%). 37 patients were P2 and 13 patients were having parity ≥ 3. . In comparison to our results **Agarwal et al[9]** reported that age of the subject in different groups varied from 20-40 years. Maximum numbers of cases were in age group 20-25 years with parity of 2. In study by **Arya et al[10],** population was young, with a mean age of 32.6 years. In study by **Chawala et al[8],** majority of the patients belong to 21-25 years of age group with mean age of patients with PPIUCD insertion was 24.81±3.14 years.

In our study majority of cases were literate (92.31%) and, majority were residing in Urban area (54.62%). In comparison to our results **Agarwal et** al[9] reported that maximum number of subjects from rural areas (93 out of 150) and 57 out of 150 were from urban areas. Study by **Gupta et al[11]**, majority were illiterate (44%) and 56% literate. Study by **Patel et al[12]**, majority (47.9%) had primary school education while 27% were illiterate.

In our study, on ultrasonographic evaluation done after 48 hrs following PPIUCD insertion, among both groups, PPIUCD was found to be in normal position in 110 (84.61%) cases and malposition was found in 20 (15.39%) cases. Among all the malposition, most common malposition was midcavity 13 (10%) cases and least common malposition was oblique 2 (1.53%). This study finding is comparable to the previous studies done by **Gupta S et al[11]** in 2014 having normally placed PPIUCD in 56% and malposition in 44% cases. Rate of malposition was found significantly more in Normal vaginal delivery group 26.15% as compared to 4.61% in Cesarean section group. In both Cesarean section group and vaginal delivery group, most common malposition was mid cavity, 2 (3.07%) in Cesarean section group and 11(16.92%) in Normal vaginal delivery groups. In both groups least common was oblique, 0(0.00%) cases in Cesarean section group and 2(3.07%) cases in Normal vaginal delivery groups. These findings are comparable to previous study done by **Gupta S et al[11]** which shows more malposition in Normal vaginal delivery group (68.2%) and in Cesarean section group (31.8%). A study done by **Chawala et al[8]** also showed malposition in Normal vaginal delivery group (62%) and in Cesarean section group (28%). This was clear that intra-cesarean placement of IUCD is better as compared to post placental and immediate postpartum group. This may be due to better visualization and expertise of the provider.

Location of IUCD <10mm from fundus in uterus were found in 95.38% of cesarean section group and in 64.62% of normal vaginal delivery group at 48 Hrs. Location of IUCD ≥10mm was found in 4.62% of caesarean section group and in 35.38% of normal vaginal delivery group. Cases with <10mm IUCD location reported comparatively lesser complaints at 6 weeks of follow up than cases with ≥10mm IUCD location in normal delivery group and similar results were seen in cesarean section group. The most common complain among normally placed IUCD(<10mm) cases was pain abdomen and BPV (Each 12.2%) and least common complaint was expulsion (0.0%). Similarly, in cesarean section group, the most common complain among normally placed IUCD(<10mm) cases was missing string (6.56%) and least common complaint was expulsion (0.0%).Similar results were noted in a study by **Chawala et al[8]**, in which most common complain among normally

placed IUCD cases was pain abdomen (50%) and least common complaint was expulsion (1.72%). Among all the malposition, mid cavity was most common, having complain bleeding per vaginum (45.24%) and least common was missing string. In the study done by **Singh S**[13], it was observed that when the distance from fundus increased, there were more complaints of pain and bleeding per vaginum.

Continuation was higher in cesarean section (96.92%) then normal delivery (95.38%) at 6 week follow up and continuation was much higher in cesarean section (98.41%) then normal delivery (82.25%) at 3 month follow up.

All the expulsions were found only in cases of ≥10mm IUCD location in normal delivery (14.28%) at 6 weeks. At 3 months of follow up, all expulsion of IUCD were found only in cases of normal delivery (5) in which expulsion in cases of IUCD location <10mm was found much lesser (3.03%) then ≥10mm IUCD location (22.22%). In cases of cesarean section, expulsion is found only in 1 case of IUCD location ≥10mm at 3 months. Thus, our study revealed that Expulsion of IUCD at 3 months follow up is confined with mainly mispositioned IUCD in Normal Delivery cases. In our study, at 3 month follow up, due to complaints reported by the cases, total 3 IUCD was removed in cases of normal delivery (5.88%) and only 1 IUCD was removed in cases of cesarean section (1.58%).In our study we found that in majority of cases cause of removal is BPV (3.84%) followed by 2.30% has pain and discharge was the cause of removal in only 0.76% cases. There was no case of perforation or infection in our study. No IUCD failure was reported in our study.

Strength

- We are providing contraceptive method to the big population thus decreasing the unmet needs of contraception.
- Counselling is done in order to increase knowledge and skills among healthcare providers.

Limitation

The limitations of the study included small sample size, shorter follow-up period. Lost to follow up as observed in the study was a limitation of the study. This made it difficult to draw a clear conclusion as what happened to those who did not complete their follow up schedule.

Conclusion

The clinical examination has its limitation in the assessment of postpartum IUCD position. Thus, sonography can be used as an adjunct to clinical examination to examine the position of the IUCD. Ultrasonography helps in determining, whether PPIUCDs are placed in normal position or malposition.Our study concluded that correct placement of postpartum intrauterine device is important to reduce the incidence of expulsion. Distance between uppermost part of endometrial cavity and uppermost part of PPIUCD on ultrasound is a good predictor of expulsion rate and associated complications, Higher the position of IUCD in uterine cavity, less the chances of expulsion, abnormal uterine bleeding and pain. We also reported that Acceptance is higher among the women who had at least primary education. The PPIUCD was demonstrably safe having no reported incidence of perforation with low rate of expulsion.

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