

Missing intrauterine contraceptive device string: Diagnosis and management at federal medical center Bida, Northcentral, Nigeria

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ABSTRACT

Background: Intrauterine contraceptive device (IUCD) is a widely accepted method of contraception. Displacement of this device is an important complication of this method of family planning.

Objective: This study aims to determine the biosocial characteristics of patients with missing intrauterine devices (IUDs), complication of missing IUD, the diagnostic and management modalities at Federal Medical Centre (FMC), Bida.

Materials and Methods: This is a 5-year retrospective study of all cases of missing IUDs that were managed at both the family planning and gynecological clinics of the FMC, Bida, between January 1st, 2010, and December 31st, 2014. A list of clientele that had IUD inserted during the study was compiled from the family planning record book, and the case files were retrieved from the medical records section. Data were collected using a pro forma and analyzed.

Results: A total number of 1540 IUDs were inserted within the period under review while 21 of the inserted IUD were missing hence a prevalence rate of 1.4% of missing IUD. Within the 5 years' review, 4854 clients were seen at the family planning clinic for various family planning services out of which 1540, used IUD giving a 31.7% of total contraceptive use thus making IUD the third-most commonly used method of contraception after norethisterone-enanthate and depomedroxyprogesterone acetate at FMC, Bida. Associated with the missing IUD were a lower abdominal pain, irregular vaginal bleeding, vaginal discharge, and co-existing pregnancy. There was no ectopic pregnancy or death recorded.

Conclusion: IUCD is an acceptable and common form of contraception worldwide and is the third-most commonly used contraceptive method at FMC, Bida. It requires minimal effort at follow-up; and missing IUD, one of the complications associated with its use could be a source of psychological disturbance to the client and also an indication for major surgery among IUD users.

Key words: Bida; contraception; missing intrauterine contraceptive device; Nigeria.

Introduction

Intrauterine devices (IUDs) have existed for centuries. Historians attributed its origin to the Arabs who stuck pebbles into the uteri of their camels to prevent them from getting pregnant on long trips across the deserts or to markets.^[1] IUDs for contraception were 1st introduced by Richter^[2] in 1909

and were further developed and deployed by Gräfenberg^[2] from 1929; there was then a resurgence with the modern era beginning in 1959 when flexible plastic IUDs were introduced.^[2]

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The intrauterine contraceptive devices (IUCDs) have been in use for several decades. The use of intrauterine contraception worldwide is extensive: 13.9% of the world's 1.16 billion women aged 15–49, married or in a union, are using this method.^[3] It is the most common method of contraception among women in the developing countries.^[4-7] It is one of the most common long-term forms of contraception used in our environment that is very effective for its ease of insertion, reversibility, and less cumbersome in follow-up.^[1,3-6] In general, pregnancy rates for the current IUD in use (including TCu380A) are <1/100 woman years and they have been found to be as effective as implants, injectable contraceptives, and voluntary male or female sterilization.^[1] Available studies in Nigeria put IUD users in the range of 47%–66% of contraceptive acceptors in different family planning centers,^[1,6-8] and it is used for a longer period than other reversible contraceptive methods. It is, however, associated with few complications which include displacement (missing IUD), intermenstrual bleeding, menorrhagia, pelvic pain, pelvic inflammatory disease, failure resulting in pregnancy with the IUD *in situ*, increased risk of ectopic pregnancy, expulsion, transmigration, coital difficulties, and menstrual abnormalities resulting in high discontinuation rates in some studies.^[1,6,7] The prevalence of missing IUD varies from center to center with an incidence of 0.5%–2.0%,^[7,8] although an incidence of 0.25% was reported in Ilorin.^[9]

IUCD could be impregnated type (e.g., copper T) or inert (e.g., Lippes loop). The latter is associated with a high risk of displacement while the impregnated-type is associated with ectopic pregnancy.^[7] Missing IUD could be in the form of expulsion, retraction of the tail into the uterine cavity, penetration into the uterine wall, migration to the cervical canal, or transmigration into the peritoneal cavity.^[10,11] There are also reported cases of migration to the rectum/anus, ileum, or bladder.^[12-14] Geared toward ameliorating these side effects, especially the problems of expulsion and menstrual abnormalities; new IUD such as gynefix and levonorgestrel impregnated IUDs (Mirena) were developed.^[1]

Displacement with uterine perforation presents almost immediately after insertion and may be due to difficult insertion, inexperience, retroverted uterus, atrophic uterus, and immediate postpartum period; otherwise, misplaced IUD usually is detected when the string cannot be found in the vagina which may be as a result of spontaneous expulsion, migration into the myometrium, uterine perforation or may be simply embedded deep into the endometrium.^[15]

The risk factors for missing IUD are varied, ranging from the time of insertion, experience of the provider to type and

size of the IUD used. Expulsion following insertion almost immediately after a term pregnancy or cesarean section is common, but for the current modifications in the IUD which reduces the risk.^[15,16] Also associated with reduced risk is intraoperative embedding of the device in the fundus or insertion after a 1st trimester miscarriage.^[16,17]

The presentation of missing IUD strings can be symptomatic or asymptomatic and simple speculum examination of the vagina will clinch the diagnosis while its detection may be by uterine sound, abdominopelvic ultrasound, hysterosalpingogram (HSG), and plain abdominal X-ray with a marker in the uterus, will locate the position of the IUD.^[11,18,19] Hysteroscopy is best used for diagnosis and retrieval of intrauterine displaced IUD.^[20,21] These investigations can detect up to 80% of cases of missing IUD.^[22] Other modalities of investigation include laparoscopy and sometimes confirmation may be done at laparotomy.^[19] The management of missing IUD include the use of retrieval hook, Spencer well's forceps, uterine sound, and sponge holding forceps with or without cervical dilatation for its removal, minilaparotomy, and laparotomy.^[9,19,23] To reduce pain during the IUD removal in a nonpregnant nondilated cervical Os, the cervix can be prepared with Lamical.^[24] When displaced into the uterine cavity with co-existing pregnancy, the IUD can be left *in situ* or carefully removed to avoid interference with the ongoing pregnancy.^[3,21]

This study aims to determine the biosocial characteristics of patients with missing IUD, complication of missing IUD, the diagnostic and management modalities at Federal Medical Centre (FMC), Bida.

Materials and Methods

This study was conducted at the FMC, Bida, a tertiary institution located in a semi-urban setting in Niger state, Northcentral Nigeria. According to the 2006 population census, Bida is the 2nd largest city in Niger state,^[14] with a population of 185,553 inhabitants. They are predominantly Muslims and farmers. It is about 90 km from Minna the state capital and 240 km from Abuja. The hospital receives referrals from primary health centers and general hospitals in the state and five neighboring states of Kwara, Kogi, Kaduna, Kebbi and Oyo as well as Federal Capital Territory, Abuja. The hospital is a 265 bedded facility, and the department of obstetrics and gynecology provides antenatal care, emergency obstetrics care, postnatal, and gynecological services by teams of 5 consultants, 20 resident doctors and 8 interns and 74 midwives.

The family planning unit of FMC, Bida is run by a consultant obstetrician and gynecologist. There are also family planning

nurse practitioners, resident doctors in the department are posted to the clinic on monthly basis and trainee nurses who provide the IUDs, often under the supervision of consultant. There are other clinical services provided, and the missing IUDs were managed by the doctors.

This is a retrospective study of missing IUDs managed at family planning unit of FMC, Bida from January 2010 to December 2014. The inclusion criteria were cases of IUDs inserted and consequently missing IUDs managed at the study center. Patients who were referred to our center due to complications following IUD inserted at other facilities were excluded from the study.

A list of clientele that had IUD inserted during the study was compiled from the family planning record book, and the case files were retrieved from the medical records section. The clients sociodemographic data, type of previous contraception used if any, providers of the IUD, timing of the insertion, diagnostic method used, treatment, and complications following the missing IUD were retrieved from the case records using a data collection sheet for analysis. The data obtained were analyzed using SPSS version 21.20 (IBM Corp., New York, USA). Qualitative variables were summarized using frequencies and percentages, while mean and standard deviation were used to describe quantitative variables.

The study was approved by the Ethics and Research Committee of the hospital.

Results

The study period was 5 years within which a total of 4854 clients were seen, 1540 women used IUD, thus IUD users accounted for 31.7%. Twenty-one cases of missing IUDs were reported, diagnosed, and managed giving a prevalence of 1.4% of the total IUDs used. Of the 21 cases, 20 case notes were retrieved giving a retrieval rate of 95.2% (20/21).

Fifteen (75.0%) of the patients were married. One patient (5%) was a widow and four (20.0%) were divorcee. Majority 17 (85.0) were Muslims while 3 (15.0%) were Christians. There were 17 (85.0%) Nupes, 2 (10.0%) Yorubas, and 1 (5.0%) Edo. Most of the patients 14 (70.0%) were using IUD method of contraception newly and had not used any form of contraception in the past while the remaining six had used different types of contraception.

The age range of the patients was from 25 to 49 years, and the mean age was 36.25 ± 5.07 years. The highest frequency occurred among the 35–39 years 8 (40.0%) age group, followed by 5 (25.0%) in 30–34 years of age group, 4 (20.0%)

in 40–44 years of age group, 2 (10.0%) in 25–29 years of age group, and 1 (5.0%) in ≥ 45 years of age group. No teenager used IUD within the period. The parity ranged from 0 to 11, with mean parity of 6.05 ± 1.6 , para 5–7 had the highest (35%) followed by para 8 and above (30%). Twelve patients (60.0%) had informal (Basic Quranic) education, 4 (20.0%) had primary education, and 3 (15.0%) secondary education while 1 (5.0%) had tertiary education. Ten patients (50.0%) were homemakers, 5 (25%) were civil servants, 4 (20%) were traders while 1 (5.0%) was a student. Missing IUD was recorded across the social strata; however, people of low socioeconomic status were worse affected [Table 1].

Most of the IUD insertion 14 (70.0%) occurred during the menses, followed by 4 (20.0%) and 2 (10.0%) at the puerperal and postabortion period, respectively. Most of the missing IUDs 14 (70.0%) were inserted by nurses, while doctors inserted 5 (25.0%). The remaining 5% were no stated [Table 2].

The diagnostic modality mostly employed was the abdominopelvic ultrasonography in 10 (50.0%), followed by the use of uterine sound in 5 (25.0%) of cases. Plain abdominal X-ray was used in 3 (15.0%) while HSG was used in 2 (10.0%) of cases. In the management of the missing IUD, a retrieval hook was used in 12 (60.0%) of cases, while dilatation and retrieval was performed in 5 (25.0%) of cases. Three patients (15.0%) had laparotomy [Table 3].

Complications of missing IUD in this study ranged from pain at the lower abdomen 5 (25.0%), irregular vaginal bleeding

Table 1: Sociodemographic characteristic of the patients

Parameter	Frequency (%)
Age (years)	
25-29	2 (10.0)
30-34	5 (25.0)
35-39	8 (40.0)
40-44	4 (20.0)
≥ 45	1 (5.0)
Parity	
0-1	2 (10.0)
2-4	5 (25.0)
5-7	7 (35.0)
≥ 8	6 (30.0)
Education	
Informal (basic Quranic)	12 (60.0)
Primary	4 (20.0)
Secondary	3 (15.0)
Tertiary	1 (5.0)
Occupation	
Housewife	10 (50.0)
Trading	4 (20.0)
Civil servant	5 (25.0)
Schooling	1 (5.0)

Table 2: Time of intrauterine contraceptive device insertion and cadre of provider

Parameter	Frequency (%)
Time of insertion	
During menses	14 (70.0)
Puerperium	4 (20.0)
Postabortion	2 (10.0)
Care provider	
Doctors	5 (25.0)
Nurses	14 (70.0)
Not stated	1 (5.0)

Table 3: Method of diagnosis and management options

Parameter	Frequency (%)
Method of diagnosis	
Uterine sound	5 (25.0)
Abdominopelvic ultrasound	10 (50.0)
Plain abdominal X-ray	3 (15.0)
HSG	2 (10.0)
Management options	
Retrieval hook	12 (60.0)
Dilatation and retrieval	5 (25.0)
Laparotomy	3 (15.0)

HSG, Hysterosalpingogram

4 (20.0%), vaginal discharge 3 (15.0%), and co-existing pregnancy 1 (5.0%). However, 7 (35.0%) patients were asymptomatic.

Twelve patients (60.0%) had a displacement of the IUD into the uterine cavity, three patients (15.0%) into the peritoneal cavity, while three (15.0%) patients had displacement into cervical canal and two (10.0%) into uterine wall.

Discussion

The prevalence of IUD as a contraceptive during the period under review was 31.7% thus making IUD the third-most commonly used method of contraception after norethisterone-enanthate and depomedroxyprogesterone acetate. Twenty-one cases of missing IUDs were reported, giving a prevalence of 1.4% of the total IUDs used. Associated with the missing IUD were lower abdomen pain 5 (25.0%), irregular vaginal bleeding 4 (20.0%), vaginal discharge 3 (15.0%), and co-existing pregnancy 1 (5.0%). However, 7 (35.0%) patients were asymptomatic.

This was a retrospective hospital-based study with an obvious selection bias, which could compromise the generalization of the key findings. Lack of detailed information on the specific difficulties encountered at the insertion of IUDs in this study limited the depth of the analysis, nevertheless valuable information regarding missing IUDs in a semi-urban setting; north-central Nigeria was generated.

The uptake rate of IUCD in this study was 31.7%; this is in consonance with the reported range of 5%–40% worldwide used of IUD by married women of reproductive age excluding China.^[3,7] China has the highest prevalence rate of 49.8% due to effective birth control policy with over 100 million Chinese women relying on this method of birth control.^[11] The prevalence of missing IUD within the study period under review was 1.4% which is in agreement with the finding from other studies that quoted figures of 0.5%–2%.^[4,5,14] This finding is however in contrast to the figure of <1% reported by other workers.^[3,6,7,9,25]

Majority of the women who used IUD during the study were aged 30–39 years, this is comparable to report of other researchers,^[1,26,27] but at variance with the findings from Lagos^[17] and Ilorin^[9] where most women using IUD were aged between 21 and 30 years.

The mean parity in this study was 6.05 ± 1.6. During the period under review, grand multiparous women constituted the majority of clients who accepted IUD in our center; consequently, this group comprised 65% of clients with missing IUDs. This finding is consistent with report by other workers.^[26,27] Nulliparity accounted for 5.0% of the missing IUDs, but in a study at Enugu, South-east Nigeria, no nulliparous client was offered IUD; because of the fear expressed concerning future fertility after discontinuation.^[28] However, other studies have shown that women who use IUD have fertility rates in the 1st 6–12 months' following discontinuation similar to nonusers and suggested that such fears should be abandoned.^[29] The sociocultural practice of the population under study might have contributed to the high parity at a relatively younger age. The predominance of Muslim in index study is not surprising because of the Muslim background of the population.^[30] In the northern part of Nigeria, studies with IUDs have shown a similar trend where the population is predominantly Muslims.^[31] Consequently, majority commence obstetric career at a relatively younger age, hence most were already grand multiparous before 35 years.

Only 40.0% of the clients had a formal education while the majority (60.0%) had informal (Basic Quranic) education with its attendant adverse effect on the level of their perception of the missing IUCD and the need to seek medical attention. This finding is at variance with Port Harcourt study where majority of the acceptors had formal education.^[11]

About 70% of the clients who had missing IUD were using IUD for contraception for the 1st time with no previous use of any form of contraception. It was noted that most of the

missing IUD were reported within the 1st 6 months of use in line with published reports,^[8,9,17,32,33] with only few reporting the missing IUD within 2 weeks of its disappearance.

Fourteen cases (70.0%) of missing IUDs were inserted by nurses while 25.0% were by doctors. This is at variance with the results from Ilorin^[9] Lagos^[23] and the Bogata^[34] studies where over 70% of missing IUDs were inserted by trainees. The Bogata study noted no significant difference in the IUD providers (nurses compared with the physicians) when use effectiveness was compared.^[26]

Majority of the IUD insertion and hence missing IUD were inserted during menstruation as was reported in other studies as this period guaranteed that the client was not pregnant and it is easier for the inserts to pass through the cervical Os and the incident of postinsertion infection with antibiotic used is reduced.^[7-9,17] Immediate postpartum, puerperal, and postabortion insertion of IUD were few in this study while the majority was within 6 months–1 year of childbirth and usually during their menses. This observation is probably due to the fact that most clients in this environment will only seek contraception when they are ready to resume coitus following decision to wean or stop breastfeeding. No postcoital insertion was performed.

In this study, 35% of the patients had no symptoms other than missing string of device which is similar to 32.4% and 37.14% reported respectively by other workers,^[27,35] but lower than 40.9% reported in another study.^[26] Abdominal pain with variable nature and intensity, presented by 25.0% of patients in this study is lower than 31.33% and 42.86% reported respectively by other researchers.^[26,27] Four patients (20%) had irregular vaginal bleeding; this is lower than 9.09% reported in Pakistan.^[26] Vaginal discharge was reported in 15% of patients which is higher than 4.55% reported in a study from Pakistan.^[26] Co-existing pregnancy was found in only one client (5%) who had a 10-week-old pregnancy with missing IUD; this is lower than 7.71% reported by Elahi and Koukab^[27] and 9.09% by Jillani *et al.*^[26] The device was hanging from the cervix and removed easily without any complication. An important case of multiple IUDs in a pregnant uterus was reported in the literature.^[36]

Complications of missing IUD which include an unwanted pregnancy may arise with a reported rate of 1–4 per 100 IUD women-years. However, newer generations of IUDs result in fewer cases of co-existing pregnancy at a rate of 1 per 100 IUD women-years. IUCD is known to prevent intrauterine than ectopic pregnancies, but there was no incidence of ectopic pregnancy or maternal death following missing IUD in this

study although, some reported an incidence of 0.28%^[37] of ectopic pregnancy in IUD users while others reported a 3.5 relative risk over nonusers.^[38] There were 3 (15.0%) cases of uterine perforation although low was, however, higher than the 1.8% reported in Lagos.^[23]

The most common mode of diagnoses was the use of abdominopelvic ultrasound accounting for 50.0% of diagnosis made, followed by the use of simple uterine sounding in 25.0%. This compares favorably with results of other studies where simple uterine sounding and abdominopelvic ultrasound were the most common diagnostic tools.^[9,33] HSG was the only invasive procedure employed in the diagnosis while laparoscopy, hysteroscopy, and laparotomy were not used which is similar to findings in Brazil.^[39]

In this study, the use of retrieval hook was the 1st line of management and was successful in 60.0% of cases, which was similar to the report from Lgaos^[23] but lower than 76.20% reported in Ilorin.^[9] Dilatation and curettage and retrieval hook were used in 10.0% similar to 9.09% in Pakistan study.^[26] Three patients (15.0%) had laparotomy in this study which is lower than 40.9% reported by some researcher^[26] but higher than 5.56% in another report.^[40] The high incidence (40.9%) of transperitoneal migration of IUD in the Pakistan study was attributed to improper training of medical personnel who are involved in the insertion of IUD.^[26] Three patients (15.0%) who had migration of IUD into the cervical canal were easily retrieved by artery forceps. Neither hysteroscopy nor laparoscopy was used in the management of the patients in our study.

Conclusion and Recommendation

In conclusion, IUCD is a widely accepted, long-term, effective method of contraception with few complications. Missing IUD occurred in all the social class strata but more in the low socioeconomic status. Women who were illiterate or had low level of education had early marriage and as a result completed their desired family size early attaining a parity of 5 or more before the age of 35 years and consequently seek family planning advice and services, hence more cases of missing IUD were found among women of the age group at 30–39 years.

Appropriate counseling and good selection of women using IUDs will result in less reported cases of missing IUD and also motivate them to the present early whenever they are unable to feel the IUD string. The need for laparoscopy in the diagnosis and management of missing IUD which is known to reduce intervention by laparotomy cannot be overemphasized. Since there is increasing acceptance of

IUDs, there is a need for future research to identify newer devices with lesser complications and also better ways of its application to significantly reduce the associated complications.

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Conflicts of interest

There are no conflicts of interest.

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