Incarcerated and Transmigrated Intrauterine Contraceptive Devices Managed at a Tertiary Care Teaching Hospital of East Delhi: A 5-Year Retrospective Analysis

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Abstract

Purpose of the Study Intrauterine contraceptive devices (IUCDs) are highly effective form of long-acting reversible contraception having least number of complications. We aimed to find the incidence, risk factors and the management done for incarcerated and transmigrated intrauterine contraceptive devices at a Tertiary Care Teaching Hospital during past 5 years.

Methods A cross-sectional retrospective analysis of 5 years (January 2013–December 2017) was done, and the

case records from Medical Record Department and Family Planning Unit of our institution were analysed.

Results Total number of IUCD insertions done in last 5 years (from January 2013 to December 2017) in our institution was 4557. Misplaced IUCDs requiring surgical interventions were 71 (1.6%) out of which 63 (88.7%) were incomplete perforations or embedded and 8 (11.3%) were complete perforations or transmigrated IUCDs. Transmigration sites were omentum, uterovesical fold, mesentery and bladder. Laparotomy was needed in 4 (5.6%), and 2 (2.8%) needed each laparoscopy and cystoscopy. Main risk factors identified were postpartum previous on or two caesarean sections, low parity, grade of operator and IUCD and uterocervical length discrepancy.

Conclusion The risk of perforation should not be a reason to defer IUCD insertion and every effort should be made to bring down its failure and complication rates.

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Keywords Transmigrated · Incarcerated · Intrauterine contraceptive devices · Copper T

Introduction

Intrauterine contraceptive devices (IUCDs) have been in use since 1965, and they are most popular, highly effective form of long-acting reversible contraception (LARC) [1]. Its complications include method failure, expulsion and perforation (partial or embedded and complete or transmigrated/translocated).

Risk factors for perforation are lactation and prolong breastfeeding that causes hyper-involution of uterus and low-oestrogen endometrium during postpartum state. This leads to uterine atrophy, thinning of the uterine walls and soft consistency of the uterus that may predispose to uterine perforation [2]. The clinician perceives less resistance to insertion, and the women experience less pain during the procedure, due to circulating higher endorphin levels. Discrepancy between the size of the IUCD and that of the uterine cavity may cause the production of asymmetrical uterine forces and can lead to copper T embedment and secondary perforation [3–5]. Other risk factors could be postpartum (within < 6 months) insertion, less experienced clinicians, high number of previous abortion and lower parity.

Fortunately, the incidence of perforation is low 0.05–1.3/1000 users [1]. Whatever may be the cause of perforation, it has a significant impact on the women in which it occurs.

Aim

To find the incidence, risk factors and the management done for incarcerated and transmigrated intrauterine contraceptive devices at a Tertiary Care Teaching Hospital during past 5 years.

Materials and Methods

A cross-sectional retrospective analysis of 5 years (January 2013–December 2017) was done, and the case records from Medical Record Department and Family Planning Unit of our institution were analysed. Data were collected about the women with missing string and the diagnosis of incarcerated or transmigrated IUCD and were posted for surgical intervention (hysteroscopy/laparoscopy or laparotomy). Important inclusion criteria included were X-ray or USG documentation of the presence of an IUCD in the uterus or abdomen.

Results

Total number of IUCD insertions done in last 5 years (from January 2013 to December 2017) in our institution was 4557. Number of insertions mainly postpartum IUCD has increased drastically in the last 5 years [Fig. 1]. Misplaced IUCD requiring surgical interventions were 71 (1.6%) out of which 63 (88.7%) were incomplete perforations or

Fig. 1 Changing trends of IUCD insertion

Table 1 Sociodemographic profile of patients

	No. of women	Percentage
<i>Age (years)</i>		
20–25	26	36.62
25–30	29	40.85
30–35	4	5.63
35–40	5	7.04
40–50	5	7.04
> 50	2	2.82
<i>Living issues</i>		
0	2	2.82
1	34	47.89
2	29	40.85
≥ 3	6	8.45
<i>Educational status</i>		
Primary	27	38.03
High school	33	46.48
Secondary	8	11.27
Graduation	3	4.23
<i>Occupational status</i>		
Homemaker	49	69.01
Maid	9	12.68
Business	7	9.86
Labourer	5	7.04
Health Professional	1	1.41
<i>Place of IUCD insertion</i>		
PHC	4	5.63
District Hospital	3	4.23
Tertiary Care Teaching Hospital	64	90.14
<i>Type of IUCD</i>		
Lippes loop	3	4.23
Multiload	7	9.86
Copper T 375	24	33.80
Copper T 380A	37	52.11

embedded and 8 (11.3%) were complete perforations or transmigrated IUCDs.

Twenty-nine (40.85%) women were between 25–30 years of age, and 2 (2.82%) were postmenopausal. Youngest woman was 21 years and the oldest was 70 years age. Thirty-four (47.89%) and 6 (8.45%) women had only one and more than 3 living issues, respectively. Majority were educated up to high school only and were homemakers, with mean monthly income of Rs. 10,005.10 ± 9871.22. Sixty-four (90.14%) IUCD insertions were done in our institution itself and rest were done in District Hospital and Primary Health Centres (Table 1).

It was observed that postpartum IUCD insertions (PPIUCD) were 54 (76%), out of which majority were previous 2 lower segment caesarean sections. Postabortal

interval IUCD insertions were 11(15.49%) and 6 (8.45%), respectively [Fig. 2].

Majority were multiload and copper T 380A acceptor, but 2 (2.8%) were lippes loop acceptors also.

Thirty-nine (54.93%) women presented with some gynaecological complaints and were not sure of missing string and commonest complaint being abdominal cramps and dysmenorrhoea. Thirty-two (45.07%) women presented with missing string only (Fig. 3).

Out of 32 women, 19 (59.3%) women felt missing thread within 1 year of insertion, while 13 (41%) women felt after than 3 years (Table 2). Missing thread within one year indicates technical fault, and perforation could have occurred at the time of insertion, while missing thread after 3 years could be due to multiple factors like chronic myometrial erosion by IUCD, spontaneous uterine contractions, bowel peristalsis and bladder contraction. Seven (21.8%) and 2 (6.2%) women reported to hospital after 1 and 6 months of missing thread, respectively (Table 3). This indicates that proper counselling and patient education were lacking among average number of women, which made them report to hospital late. Uterocervical length was normal in 6 (8.45%) women, and rest had either small or large UCL.

It appeared that more perforations were caused by senior resident but when number of perforations was compared with the actual number of IUCD inserted by different categories of doctors, it was observed that number of complications depends upon the experience of the doctors (Table 4).

Considering intraoperative findings and management, it was found that among 63 women with partial perforation, 44 (70%) had IUCD impacted in myometrium and rest had deeply buried in myometrium reaching up to serosa. All IUCDs were removed hysteroscopically although 19 (30%) needed laparoscopy as well. Among 8 (11.8%) women with complete perforation, the transmigration sites were omentum, uterovesical fold, mesentery and bladder. One woman presented with IUCD in bladder with 6 weeks pregnancy. Laparotomy was needed in 4 (5.6%), and 2 (2.8%) needed each laparoscopy and cystoscopy [Table 5, Fig. 4].

Discussion

Perforation may be partial or embedded or impacted (with the depth of IUCD in varying degrees within the uterine wall) or complete or transmigrated or translocated (totally in the abdominal cavity). There are two probable mechanisms for uterine perforation due to IUCD, primary perforation (perforation at the time of insertion) and secondary perforation (perforation at least 4 weeks or more after insertion), which may be caused by gradual erosion

Fig. 2 Time of insertion—IUCD **Fig. 3** Gynaecological complaints among women not sure of missing thread **Table 2** IUCD insertion to missing thread interval (*n* = 32)

Interval	<i>n</i> %
< 1 month	11 (34.3%)
1–3 months	3 (9.3%)
3 months–1 year	5 (15.6%)
1–3 years	0
3–5 years	8 (25%)
5–10 years	2 (6.2%)
> 10 years	3 (9.3%)

Table 3 Missing thread—reporting in hospital (interval)

Interval	No. (%) of women
Immediately or < 1 week	19 (59.3%)
< 1 month	4 (12.5%)
> 1 month	7 (21.8%)
> 6 months	2 (6.2%)
Total	32

Table 4 Grade of operator (Tertiary Care Teaching Hospital)

Grade of operator	Total no. of IUCD insertion in 5 years	No. (%) of women with misplaced IUCD	(%) Misplaced IUCD per total insertions
Interns	512	11 (17.1%)	2.14%
Postgraduates	894	13 (20.31%)	1.4%
Senior resident	2491	37 (57.8%)	1.48%
Consultants	660	6 (9.3%)	0.9%
Total	4557	64	

through the myometrium or the spontaneous migration due to the physiological mechanisms like spontaneous uterine contractions, bowel peristalsis and bladder contractions [6]. Common sites for transmigration include bladder, bowel, omentum, uterovesical folds and broad ligament. Rarely, IUCD may migrate to pouch of Douglas or even women may present with intrauterine pregnancy and migrated IUCD into distal sigmoid colon [7, 8].

Goyal S [9] reviewed 240 IUCD acceptors in 1 year and reported perforation rate of 0.8%. Two women presented with transmigration, one into bladder with symptoms such as dysuria, frequency and suprapubic pain and another into broad ligament with no symptoms. The present study observed perforation rate of 1.6% in 5 years of

retrospective analysis, out of which 8 women presented with translocated IUCD.

Another one year retrospective analysis of 723 women reported that the major complaint was lower abdomen pain 15 (30%) followed by menstrual irregularities 12 (24%), vaginal discharge 6 (12%) and missing thread 5 (10%). Only 2 (4%) women had uterine perforation, one was partial perforation where left transverse arm of device had perforated uterine wall close to the left uterotubal junction and another had complete uterine perforation and copper T was lying in the peritoneal cavity. Both of them needed laparotomy [10]. Another risk factor identified was less experienced providers in 42 (84%) women. The present study also observed that the abdominal cramps and dysmenorrhoea were the main complaints and persistent urinary tract infections may be the indication of IUCD migration into bladder. Skilful insertion and the grade of operator are important considerations.

Braaten et al. [11] found that the adenomyosis was associated with misplaced IUCD and univariable analysis showed suspected adenomyosis (OR 3.48, 95% CI 1.36–8.91), whereas prior vaginal delivery (with or without another delivery by caesarean delivery) was protective (OR 0.68, 95% CI 0.43–1.09). An increased risk for perforation was observed if IUCD was inserted 6–9 weeks postpartum (OR 8.77, 95% CI 2.41–31.88, $P = .001$) and breastfeeding (OR 11.81, 95% CI 2.03–68.79, $P < .008$). The present

Table 5 Intraoperative findings and management

Intrauterine embedded IUCD(N = 63)	No. (%) of women	Management
Partially embedded in myometrium	44 (70%)	Hysteroscopically removed
Small part of IUCD seen in uterus, rest buried in myometrium and a part protruding through serosa	19 (30%)	Both hystero-laparoscopy done Removed hysteroscopically
Extrauterine (complete perforation/transmigrated IUCD) (n = 8)		
1. Embedded in dense adhesions at omentum and UV junction		Laparoscopically removed Cystoscopy—normal
2. Embedded in mesentery with dense ball of adhesions		Laparoscopy → Laparotomy
3. Embedded in omentum and dome of bladder—dense adhesions with pus drained		Laparoscopy → Laparotomy Cystoscopy—normal
4. Buried in uterovesical fold		Laparoscopy → Laparotomy Cystoscopy—normal
5. Organized mass (3 × 2 cm) of omentum, IUCD, tube, small bowel with pus		Laparoscopy → Laparotomy
6. Embedded in omentum near uterosacrals		Laparoscopically removed
7. Site of healed perforation on anterior wall uterus and IUCD within bladder, tiny calculi seen		Hystero-laparoscopy done Cystoscopically removed
8. 6 weeks of pregnancy with IUCD in bladder		Suction and evacuation Hysteroscopy IUCD removed cystoscopically

Fig. 4 Management

study observed that postpartum insertion, especially previous one, or more caesarean sections were main risk factors for perforation. Another important risk factor observed in our study was uterocervical length and IUCD size discrepancy, as 2 postmenopausal women presented with UV prolapsed and forgotten IUCD that was displaced. Her IUCD must have been inserted in her reproductive years, and now postmenopausal atrophic uterus leads to the displacement. Also, number of years of inserted IUCD may impact the displacement as 8 (25%) women noticed missing thread after 5 years and presented with secondary perforation as discussed above.

The treatment of the misplaced IUCD is surgical, either hysteroscopy, laparoscopy or laparotomy. Withdrawal of the migrated IUCD is advisable even if the patient is asymptomatic, so that further complications like a bowel and bladder perforation or a fistula formation can be prevented.

Recommendations

Sixty percentage women presented with missing string within 1 year of insertion, which probably indicates technical fault at the time of IUCD insertion, so proper training and supervised insertion are recommended.

Since 28 and 6.2% women reported after 1 and 6 months of the missing thread, respectively, it is recommended that IUCD acceptors should have regular follow-ups and should report immediately. Recommended follow-up schedule after interval IUCD insertion [12]: first visit after the first menstrual period or after 1 month whichever is earlier, and subsequent visits after 3 months and thereafter once a year. Unscheduled visits depend upon the warning signs (PAINS): P: Period-related problems or pregnancy symptoms A: Abdominal pain or pain during intercourse I:

Infections or unusual vaginal discharge N: Not feeling well, fever, chills S: String problems. Women should also be educated to change copper T 375 and copper T 380A in 5 and 10 years, respectively.

Main risk factors identified in our study were

- Postpartum insertion mainly with previous 1 or 2 LSCS, so skilful insertion and follow-up are required and symptoms like persistent abdominal pain and UTI should be thoroughly investigated.
- Low parity (majority of the women had one or two issues) may indicate IUCD and uterocervical length (UCL) discrepancy. This incompatibility can provoke uterine contraction, and the impact of these uterine forces can be significant enough to compress, distort, displace or expel the IUCD.
- Few women had normal UCL, which again indicated discrepancy. Mini copper T for UCL < 7 cms, Maxi copper T for UCL > 8 cms or frameless copper T are best suited for these women. The design of the frameless copper IUCD, due to its absence of a horizontal cross-arm and its flexibility, explains its adaptation to uterine cavities of every size and shape. These characteristics eliminate the ability of the uterus to exert expulsive forces on the frameless IUCD devices, in contrast to that seen with the framed T-shape-designed IUCDs.

Conclusion

IUCDs are most economical and reversible contraceptive measure, and every effort should be made to bring down its failure and complication rates. The risk of perforation should not be a reason to defer IUCD insertion.

Compliance with Ethical Standards

Conflicts of interest There are no conflicts of interest for any of the authors.

Ethical Statements Prior ethical clearance was obtained from Institutional Ethical Committee—Human Research of our institution.

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