

## Vesical Calculus: A complication of Intravesical migration of Intrauterine device (IUD)

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### Abstract

**Introduction:** Migration of intrauterine contraceptive device (IUD) into urinary bladder is not very common. Secondary stone formation is a rare complication. It occurs as a result of complete migration of the IUD into urinary bladder. To date, more than 80 cases of IUD migration to the bladder have been reported in the literature with varying stone sizes. A series of 15 cases to whom an IUD migrated from the uterus to the bladder and resulted in formation of a stone over it. **Methods:** A cohort of fifteen women was treated for bladder stones over migrated IUD within June 2004 to May 2012. Detailed history was maintained, diagnosis was established by pelvic ultrasonography and/or X-rays pelvis. All cases were managed by endoscopy. All cases undergo Cystoscopy and litholapaxy. **Results:** The mean age of participants was  $39.7 \pm 5.29$  years (28-49). Major objection in almost all cases was lower urinary tract symptoms; which were not responding to medical treatment, six patients had few

episodes of macroscopic hematuria. The interval between insertion of IUD and onset of symptoms ranged from 2 to 5 years. In twelve cases IUD was embedded in urinary bladder wall and an entire intravesical IUD in rest 3 with calculus formation in all of them. Stones were crushed along with retrieval of IUD as a result of which mild hematuria was reported in 4 cases. Patients remained with Foley catheter from 7 - 14 days. Postoperative recovery was uneventful. **Conclusion:** Intrauterine contraceptive device (IUD) perforation to the bladder, with stone formation, is an uncommon event. Clinically it is difficult to reach its diagnosis but persistence of lower urinary tract symptoms in women with IUD should raise the suspicion of intravesical migration. Sonologist can define intravesical migrated IUD. Endoscopy proved a better and safe procedure with a very low complication rate. **Key words:** Intrauterine Devices; Uterine Perforation; Urinary Bladder Calculi.

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### INTRODUCTION

Intrauterine contraceptive device (IUD) is the most common method of contraception by women over 3 decades. Above 100 million women using

it worldwide and it has high efficacy rate also.<sup>1</sup> Due to advantages and less number of side effects and/or complications, IUD is most popular method of family planning.<sup>2</sup> Complications with IUD are rare with risk of 0.003% of puncture during insertion. Since it is inserted, many complications may occur; including dysmenorrhea, hypermenorrhea, pelvic inflammatory disease (PID), unwanted pregnancy, spontaneous abortion,

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uterine rupture and migration to neighbouring organs. Other complications include spontaneous expulsion, mild discomfort, cramping, bleeding, spotting, infection, ectopic pregnancy and perforation.<sup>3</sup> Uterine perforation by an IUD is rare, but with serious complication. Its incidence varies from 1/35 to 1/2500 insertions of IUD. High incidence reported among patient, who lost IUD.<sup>4</sup> Literature available with case reports only. Stones formation occurs as a result of complete migration of IUD into urinary bladder. More than 80 cases of IUD migration to the bladder reported in literature, with varying stone sizes.<sup>5,6</sup> Recently, only one series of ten intravesical IUD, resulting in stone formation reported.<sup>7</sup> Review of these reported cases revealed the lack of general consensus about diagnostic tools and proper

management. In present study, we reported fifteen cases of IUD (type copper-T) migration to the bladder, with complicated stone formation. The study objective was to define the proper evaluation and management.

## MATERIALS AND METHODS

This study cohort maintained for eight years (June 2004 - May 2012), fifteen women were treated with endoscopy for bladder stones, resulting from migration of IUD to bladder. All the patients were with history of pain lower abdomen, dysuria and lower urinary tract symptoms (LUTS). Almost in all patients gynecologist or the midwife was unable to locate the device. It was assumed it had fallen out.

**Table-1**

**Clinical summary of patients with IUD migrating to the bladder and complicated by bladder stone formation**

Cases	Age (YS)	Symptoms interval	Irritative symptoms	UTI	Pelvic Pain	Hematuria	Bladder stone size (cm)	Time interval (YS)
Case 1	42	5 years	+	+	+	-	2.5	10
Case 2	38	3 years	+	-	+	+	2	5
Case 3	42	2 years	+	-	+	-	1	4
Case 4	36	1 years	-	-	+	+	1.5	4
Case 5	33	2 years	+	+	+	-	4	4
Case 6	45	3 years	+	+	-	-	3	9
Case 7	49	5 years	+	-	+	+	2.5	9
Case 8	41	10 months	+	-	+	+	3.3	6
Case 9	42	3 years	+	+	+	+	3	8
Case 10	40	4 years	+	+	+	-	1.7	7
Case 11	44	3.5 years	+	-	-	-	2	6
Case 12	28	4months	+	+	+	-	0.8	2
Case 13	34	2 years	+	-	+	+	3.5	5
Case 14	39	2 years	+	+	+	-	3	6
Case 15	43	1.5 years	+	+	+	-	2.8	4

Urine analysis and culture were performed for all cases. Diagnosis were made through ultrasonography in outpatient departments and reevaluated by plain KUB film. At surgical intervention, cystoscopy was performed in all cases.

### STATISTICAL ANALYSIS

Descriptive and inferential statistics was performed and analyzed through computer software SPSS 16.

### RESULTS

All cases were reported with intravesical IUD, complicated by bladder stone. A brief description of all cases presented in Table 1. The mean age of participants was  $39.7 \pm 5.29$  years (28-49). The time interval between insertion of IUD and appearance of urinary tract symptoms was uneven with range from 4 months to 5 years. Mean duration for appearance of symptoms from the time of insertion of IUD was  $2.34 \pm 2$  years. Irritative symptoms (frequency, urgency and nocturia) were found in all 15 cases (100%). Pelvic pain observed in 13 patients (86.67%), six cases reported microscopic hematuria (40%). Clinical examination was average in all patients except suprapubic tenderness. Urine culture was performed in all cases out of which 8 were positive (53.34%). In 7 patients E.Coli and in one subject klebsella were the organisms. These 8 were treated with proper antibiotics and a sterile culture was obtained before intervention. Rest 7 patients had already treated by general practitioners.

KUB plain radiographs showed bladder stone on IUD in all cases with sizes range 0.8 – 4.0 cm (Fig. 1). In 9 patients, stone size was greater than 2 cm. Ultra sound (US) revealed normal upper tracts. Plain x-rays KUB confirmed the diagnosis of intravesical IUD with stone formation (Fig. 2). Complete retrieval of Copper T with encrustations and stone formation was seen (Fig. 3).

**Figure-1**  
KUB x-ray. A stone forming on the side arm of the copper-T IUD is observed in the bladder area.



**Figure-2**  
Another view of the vesical calculus formation of over migrated IUD



**Figure-3**  
After retrieval from the urinary bladder



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## DISCUSSION

Intrauterine contraceptive device is the most popular method of family planning due to its high efficacy for fertility, and low cost<sup>8</sup>. IUD is widely accepted world instrument especially in under developed countries<sup>9</sup>. Now a day, the complications are spontaneous abortion, pelvic inflammatory disease (PID), septic abortion, migration into adjacent structure, bowel perforation and vesico-uterine fistula.<sup>10,11,12</sup> Other reported complications include dysmmenorrhea, hypermenorrhea, pelvic pain, ectopic pregnancy and uterine rupture.<sup>12, 13</sup> The rate of uterine perforation with IUD has been estimated to between 0-1.6 per 1000 insertion.<sup>14</sup>

The mechanism of perforation is thought to be depends on technique of insertion, type of IUD, the skill of physician and the anatomy of the cervix and uterus. Undetected extreme posterior uterine position is the most common reason for perforation at the time of insertion.<sup>11</sup> Perforation is thought to be the inexperience insertion or chronic inflammatory reaction with gradual erosion through uterine wall.<sup>15</sup>

Secondary perforation can occur by slow migration through the muscular wall of uterus which can be augmented by spontaneous uterine contractions, urinary bladder contractions<sup>16, 17</sup>. Slow migration of IUD from uterus in to bladder with formation of vesical stone is unusual and this has been reported earlier, 1 month, 3 month 3years and 13 years, partially or complete encrusted with calculi.<sup>18, 19</sup> In our series, one patient had complete encrustation of device with two stones on each limb of the IUD measuring 3 cm.

The IUD may remain silent for a long period not to be discovered until it is found to be missing.<sup>20</sup> None of our patient was noted to have lost their IUD year before the development of urinary tract symptoms. Migration of IUD into the bladder either partial or complete usually present with lower urinary tract symptom, frequency, tenesmus, suprapubic pain, dysuria, hematuria, UTI, urinary

tract obstruction secondary to stones and urinary incontinence.<sup>5, 10, 12</sup> In our patients LUTS (irritative) and supra pubic pain were the most observed symptoms. Haematuria and UTI were present in almost half of the cases.

In a literature review by Kassab and Audra presented a series of 165 cases of migrating IUDs were collected and only 23 were in bladder. The incidence of perforation was reported to be 1.6 for 1000 insertion<sup>14, 21</sup>. Ozcelik etal reported 70 cases in the literature, of these less than half resulted bladder calculus formation.

In our series the patient has very poor compliance towards follow up. They used to present local Doctor, lady health workers, lady health visitors and Family planning centers. Patient usually report late in our study. The mean time duration from onset of symptoms till endoscopic removal was 2.54 years (ranges 4 months – 5 years) while total time from the insertion of IUD till removal ranges from 2-10 years (mean 5.93 yrs).

In our patients the diagnosis was made by USG, Plain film KUB and cystoscopy. In literature plain film, USG, Transvaginal USG, Plain CT and cystoscopy are used for the diagnosis and management.<sup>15, 22, 23</sup> We did endoscopic management in all our cases. The endoscopic management is minimal invasive and for the reason that it does not prevent conversion to open surgery should it be failure. Litholapexy and IUD extraction were easily performed in our cases, because the partially migrated IUD was either under the bladder mucosa or within bladder wall gentle traction on it allowed to complete extraction.

### Following are the suggestions

1. IUD should be inserted by experience person.
2. Selection of patient by history, physical examination.
3. Patient should be informed of the potential complications of IUD.
4. Regular check up of device.

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5. A patient with LUTS with IUD regular USG after 3 month.

## CONCLUSION

Migration of intrauterine device (IUD) into bladder is a low-frequency complication. Persistent LUTS, recurrent or persistent urinary tract infections, vesical calculus in women without outlet obstruction and other evidence of any history of renal colic, these women had IUD should raise the suspicion of intravesical migration. Ultrasonography (US) is the first diagnostic tool in which suspicion is raised, verified by plain X-rays KUB and it should be confirmed by Cystoscopy. Endoscopic retrieval is a feasible and safe procedure to achieve complete extraction of the stone and IUD with very low morbidity for the patient.

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