

Hydronephrosis caused by intrauterine contraceptive device migration: three case reports with literature review

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Summary

Translocation of intrauterine contraceptive device (IUD) from the uterus rarely occurs, which can lead to serious complications. Here the authors reported three cases of IUD migration from into the ureter, bladder, and peritoneal cavity that caused hydronephrosis, respectively. All the three patients received minimally invasive surgeries and recovered.

Key words: IUD migration; Ureter; Bladder; Peritoneal cavity.

Introduction

Intrauterine contraceptive device (IUD) is commonly used for birth control [1]. In the United States, it becomes more popular, from 1.3% in 2002 to 5.3% in 2006–2010, due to its high efficacy, low-risk, and low-cost for fertility regulation [2]. Complications with IUD remain about 0.003–0.87%. Migration of IUD to other organs or cavity from the uterus is infrequent but serious [3]. IUDs can migrate to the myometrium, peritoneum, omentum, appendix, colon, etc [3–5]. It can lead to uterine perforation, pelvic inflammation, bowel perforation, vesicouterine fistula, abortion, infection, bowel obstruction and form an abscess, etc [3–5]. Here the authors reported three cases of IUD migration into the ureter, bladder, and peritoneal cavity, respectively, and minimally invasive surgery was performed.

Case Report

Case 1

A 39-year-old woman was admitted to the present department complaining of a three-month history of left waist and abdomen paroxysmal pain cramps, accompanied with radiating pain of perineum. IUD had been inserted 12 years ago. Unexpectedly, she had become pregnant two years later, but aborted. The IUD was not found and was assumed to have fallen out. Urinalysis revealed an inflammation, but a urine culture remained sterile. In ultrasonography, the position of the uterus was anteverted and anteflexed, left ureter was expanded, and left kidney seep were found. A plain abdominal radiograph showed the presence of a stone opacity around the IUD in the pelvis (Figure 1A). Because of the ureter expansion and uronephrosis, an intraudio videoenous urography (IVU) was taken, and a V-shaped foreign body with high density, embedded in the ureter was shown. A serious uronephrosis and ureter expansion were observed proximal to the foreign body (Figure 1B). A ureteroscopy was performed subsequently, a V-shaped foreign body embedded in the left lower ureter, about ten cm from the ureteral orifice was



Figure 1. — A) A V-shaped high density of foreign body in pelvis. B) Serious expansion of ureter is observed above the foreign body. C) Abdominal radiographs from patients with postoperative recovery.

Revised manuscript accepted for publication November 10, 2015

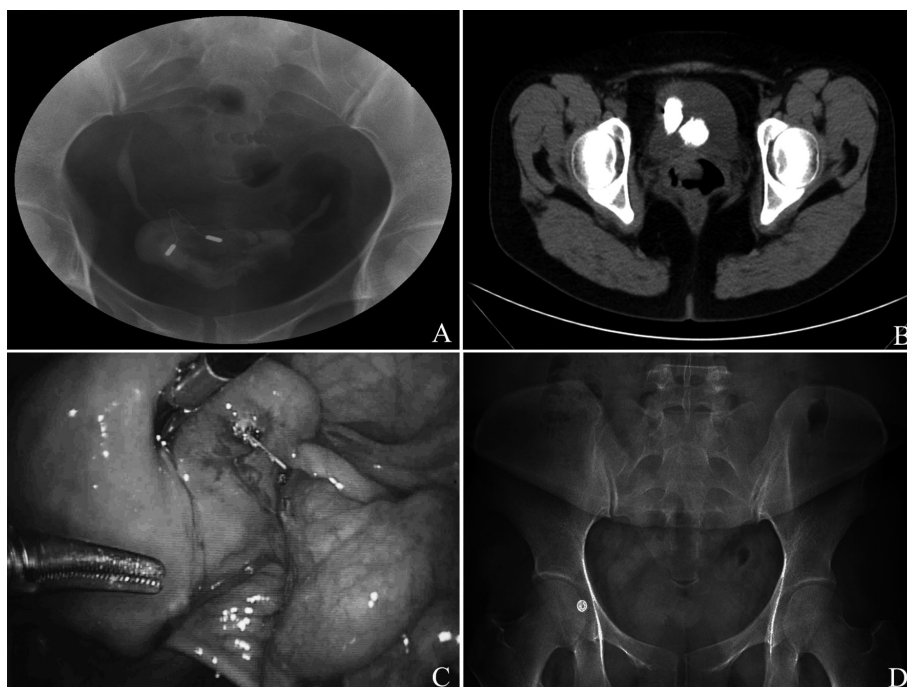


Figure 2. — A) A V-shaped high density of foreign body embedded in the bladder. B) Two calculi surrounding the foreign body. C) Foreign body is retrieved by laparoscopy. D) Abdominal radiographs from patients with postoperative recovery.

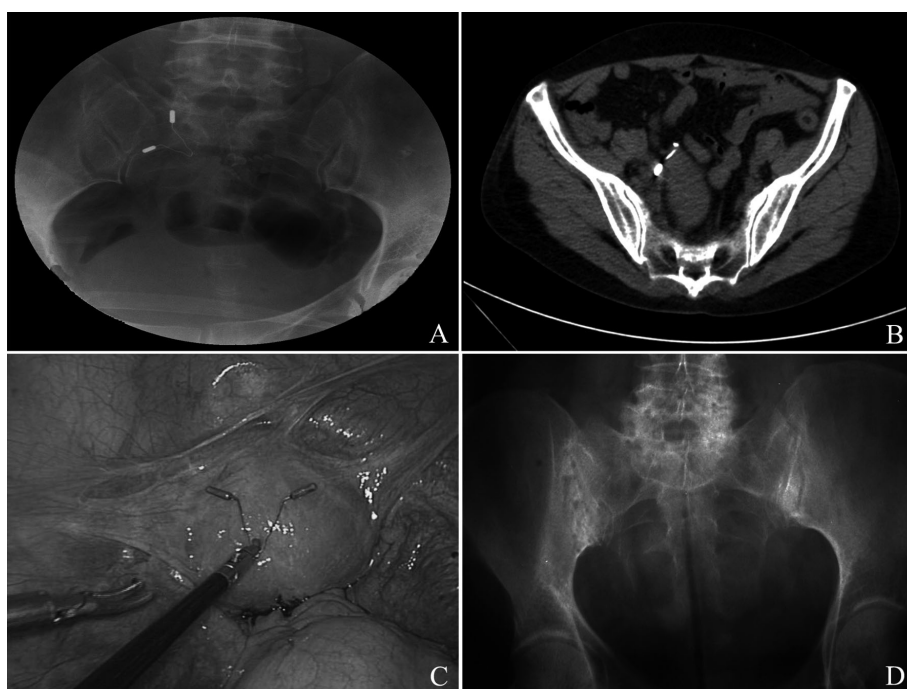


Figure 3. — A) A V-shaped high density of foreign body embedded in pelvis. B) The IUD is present a high density in CT scan. C) The IUD is retrieved successfully. D) Abdominal radiographs from patients with postoperative recovery.

shown. One branch of the foreign body was suspended in the ureter with calculus adhesive on its surface. The other branch embedded into the ureteral wall, where a relative stricture was caused by the neoformation. Pneumatic ballistic lithotripsy was used, and the foreign body was successfully removed. A ureteral stent was implanted for eight weeks and the patient recovered with no complications (Figure 1C).

Case 2

A 25-year-old female patient suffered from urinary frequency, interrupt urination, hematuria, and painful urination, but with no fever, and with a history of IUD implanted two years ago. An abdominal examination revealed tenderness on deep palpation over the suprapubic region, with no positive finding by genital physical examination and hematological investigations. Urine

analysis revealed abundant pus cells and microscopic hematuria. Two approximately calculi about 2.5×2.5 cm² were confirmed in the bladder by IVU and CT, connecting with two limbs of the foreign body into the bladder wall (Figures 2A and B). The calculi were fixed in the bladder without mobility by B-type ultrasound. A preoperative cystoscopy was performed, and two stones adhered with the limbs of the IUD which were fixed to the posterior superior bladder wall were progressively confirmed. A cystoscope pneumatic ballistic lithotripsy was performed to remove the stones, and the IUD was retrieved by laparoscopy after pre-treated antibiotics (Figure 2C). A Foley catheter was placed for one week and the patient recovered successfully (Figure 2D).

Case 3

A 41-year-old woman was referred to the present urology department for a serious right hydronephrosis. The patient was asymptomatic and the hydronephrosis was discovered by ultrasonography in a routine examination after half year of chemotherapy for lymphoma. A history of an unsuccessful pregnancy and a subsequent abortion, with an IUD implantation was recorded. Physical examination revealed deep tenderness around the lower right abdomen. Intravenous pyelography found an stricture accompanied with an proximal expansion in the right lower ureter. Meantime, a serious hydronephrosis was observed in the right kidney (Figure 3A). CT scan revealed an IUD about 2.5 cm long in the lower right abdomen (Figure 3B). Laparoscopy was performed to remove the IUD and for ureter reconstruction (Figure 3C). A ureteral stent was implanted for four weeks, and the patient recovered well (Figure 3D).

Discussion

IUD is commonly used in birth control, with over 99% effectiveness and low side effect. One of the rare but severe complications is IUD migration, with the incidence rate of about 0.003% and 0.87%. [3] Since some of the IUD migration is asymptomatic, the true incidence may be higher. IUD migration has been found in many different locations, including omentum (26.7%), pouch of Douglas (21.5%), colonic lumen (10.4%), myometrium (7.4%), broad ligament (6.7%), within the abdomen (5.2%), small bowel serosa (4.4%), colonic serosa (3.7%), mesentery (3%), colon, bladder, and retroperitoneum [3, 4, 6, 7]. However, IUD migration in urinary tract has seldom been reported. Here the authors reported three cases of IUD migration in the ureter, bladder, and peritoneal cavity, respectively, which caused severe uronephrosis and urinary tract symptoms and were successfully removed with minimally invasive surgeries.

Factors affecting IUD migration including the type of device (higher rates occur with copper-containing IUD), time point of implantation (higher rates occur in lactating women), skill of the operator, position of the uterus (higher rates occur in retroverted uteri), postpartum uterus, and degree of follow-up [3, 8, 9]. Recently, the pathogenesis of the IUD migration supposedly includes three mechanisms. First, the IUD migration can occur at the time of implantation due to uterine perforation, especially in those patients with severe abdominal pain. [2, 10, 11] Second, IUD mi-

gration occurs under a gradual pressure and necrosis of the uterine wall induced by IUD, with essential migration out of the uterus. Third, spontaneous contractions of uterus, bladder contractions, and bowel peristalsis may also cause a spontaneous migration of the IUD [2, 12, 13]. Therefore, IUD implanted by a skillful specialists is very important [14].

Ordinarily IUD migration is asymptomatic. Even the relative symptoms are not specific, depending on the location of the IUD. Migration in the abdominal cavity, intestine, and digestive tract can lead to pain, diarrhea, fever, intestinal obstruction, intestinal fistula, and abdominal abscess, etc [9, 3, 15]. In the urinary tract, the IUD migration symptoms might include chronic pelvic pain, osphalgia, microscopic hematuria, calculi, gross hematuria, recurrent and persistent urinary tract infection, vesico-uterine fistula, fistula, dysuresia, suprapubic pain, urinary tract obstruction, and even subsequent bladder cancer [3, 16, 17]. The history of IUD implantation, failure to locate its threads, and the presence of these symptoms are indicative of IUD dislocation [18]. In this report, one of the three cases was asymptomatic and the routine examination discovered serious right hydronephrosis, the other two patients were complaining of urinary irritation, urinary tract obstructive symptoms, and hematuria. All three had urinary tract obstruction and hydronephrosis which was rarely was reported.

Diagnosis of IUD migration requires a combination of patient IUD installation history, clinical manifestation, and necessary examination. Radiography, ultrasonography, intravenous urography, computerized tomography (CT), cystoscopy, colonoscopy, hysteroscopy, and ureteroscopy are useful diagnostic methods that may assist in proper diagnosis [19, 20]. When IUD migrates in the urinary system, intravenous urography and CT scan can precisely locate the migrated IUD and assist in its treatment [21, 22]. Once migration of IUD is confirmed, the World Health Organization (WHO) is recommended to remove all migrated devices, even in asymptomatic patients [3]. Recently, minimally invasive techniques are suggested [3, 23]. Endoscopic techniques, such as colonoscopy, hysteroscopy, cystoscopy, laparoscopy, and ureteroscopy cannot only diagnose but also treat the dislocation [3, 23]. As reported, 93% of the surgery successfully removed the migrated IUD with laparoscopy, however some of the surgeries were converted to open operations [23]. In the present cases, one of the IUDs was embedded in the ureter and removed by ureteroscopy; the other two cases were removed by laparoscopy. All the three patients had no complications. However, when patients fail with these methods, an open operation is necessary [23].

In conclusion, intravenous urography and CT scan can precisely locate a migrating IUD, and minimally-invasive methods, such as laparoscopy and endoscopy, can be preferred for removal and reconstruction of migrated IUD in urinary system.

Acknowledgments

This study was supported by the Science and Technology Planning Project of Gansu Province (No. 1204FKCA174).

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