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Ectopic intrauterine device in the bladder causing cystolithiasis: A case report

Yu HT *et al*. Ectopic IUD in the bladder

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Abstract

BACKGROUND

An intrauterine device (IUD) is a commonly used contraceptive among women in China. It is widely used because it is safe, effective, simple, economic, and reversible. Among the possible complications, an ectopic IUD in the bladder is rare. It occurs insidiously, has a long course, is associated with a high risk for injury, and is difficult to treat.

CASE SUMMARY

A 44-year-old woman was admitted for repeated episodes of urinary frequency, urgency, and dysuria over three months. Laboratory tests revealed significantly elevated urine leukocytes and bacteria. Urine culture suggested colonization with *Enterococcus faecalis*. Abdominal computed tomography images suggested an abnormally positioned IUD that was protruding into the bladder. Cystoscopy revealed a metallic foreign body with multiple stones on its surface in the left posterior bladder wall. The foreign body measured approximately 1 cm. Hysteroscopy revealed the arm of a V-type metal IUD embedded in the middle and upper sections of the anterior wall of the cervical canal. The majority of the IUD was located in the uterine cavity. Cystoscopy was performed, and a holmium laser was utilized to break the stones

attached to the portion of the IUD in the bladder. The IUD was then removed through hysteroscopy.

CONCLUSION

Ectopic IUDs in the bladder can be diagnosed with thorough imaging and safely removed through cystoscopy or hysteroscopy.

Key Words: Migrated intrauterine device; Cystoscopy; Hysteroscopy; Bladder stones; Urinary tract infection; Case report

INTRODUCTION

According to the 1998 annual report of the World Health Organization, intrauterine devices (IUDs) are a cost-effective, reversible contraceptive method. They are commonly used worldwide and are the main contraceptive method among Chinese women[1]. According to statistics, the incidence of IUD displacement is approximately 0.1%-0.3%[2]. The spontaneous displacement of an IUD into the peri-uterine area may cause serious complications, such as vesicouterine fistulas, intestinal perforation, hydronephrosis, and even renal failure[3-7]. Intravesical translocation of an IUD is rare and may present as suprapubic pain or discomfort, dysuria, recurrent urinary tract infections, or stone formation. Removal through endoscopy or open surgery is currently recommended as the best treatment option. Herein, we report a case of a patient who presented with recurrent urinary tract infections and was incidentally found to have an IUD partially positioned in the bladder through computed tomography (CT).

CASE PRESENTATION

Chief complaints

The primary complaints included urinary frequency, urgency, and pain over a period of three months.

History of present illness

A 44-year-old woman was hospitalized in our department for a 3-mo history of urinary frequency, urgency, and pain. She denied fever, lumbago, back pain, and hematuria.

History of past illness

The patient had no contributory medical history, except for an IUD implantation seven years prior.

Personal and family history

The patient had no pertinent family history.

Physical examination

No obvious signs were found on physical examination. The patient did not demonstrate any pain on percussion of the bilateral renal areas or obvious tenderness along the path of the ureters. The patient exhibited normal external genitalia.

Laboratory examinations

A routine urinary examination was performed when the patient first developed symptoms. The examination results were as follows: 844 red blood cells/uL, 1063 white blood cells/uL, and 1873 bacteria/uL. She was treated with antibiotics; however, after 3 mo, another routine urine analysis demonstrated 131 red blood cells/uL, 330 white blood cells/uL, and 432 bacteria/uL. After she was hospitalized, her urine test showed 3 red blood cells/uL, 25 white blood cells/uL, and 5 bacteria/uL. A urine culture demonstrated colonization with *Enterococcus faecalis*.

Imaging examinations

The patient had recurring symptoms of urinary tract infection. Combined with her history of IUD implantation, we considered IUD displacement. CT revealed an

abnormally positioned IUD, which had penetrated the uterine wall and was protruding forward into the bladder (Figure 1). Cystoscopic and hysteroscopic exploration was subsequently scheduled. Cystoscopy was performed with a 22-Fr cystoscope with a 70° lens. Cystoscopy demonstrated an IUD, which had penetrated the left posterior bladder wall. Approximately 1 cm of the IUD was located in the bladder cavity, and a large number of stones were visible on its surface (Figure 2A). Subsequently, hysteroscopy demonstrated a V-shaped IUD in the middle section of the cervical canal. One of the arms of the IUD was notably incarcerated in the muscular layer of the canal (Figure 2B).

FINAL DIAGNOSIS

Considering the patient's history and laboratory and imaging findings, the patient was diagnosed with an ectopic IUD.

TREATMENT

We administered cefoxitin (2 g intravenously every 8 h) based on the patient's urine culture results and drug sensitivity test. CT, cystoscopy, and hysteroscopy demonstrated that majority of the IUD was located in the uterine cavity; however, the portion of the IUD in the bladder was complicated due to multiple stones. Thus, we decided to use a holmium laser (Lumenis, Holmium 1.0 J × 20 Hz) to break the stones during cystoscopy and removed the ectopic IUD from the uterine cavity with the hysteroscope (Figure 3). We reassessed the bladder and uterus at the end of the procedure and confirmed that there was no obvious bleeding or fistula.

OUTCOME AND FOLLOW-UP

The patient had no obvious hematuria or vaginal bleeding after surgery. The urinary catheter was removed after one week, and the patient's lower urinary tract symptoms showed complete resolution. A routine urine examination was performed after three months and demonstrated no obvious abnormalities.

DISCUSSION

As reported in the literature, IUDs are most commonly displaced into the omentum (26.7%), uterorectal depression (21.5%), colorectal cavity (10.4%), myometrium (7.4%), broad ligament (6.7%), or abdominal cavity (5.2%)[8]. The translocation of an IUD through uterine perforation and into the bladder wall is rare, with an incidence of approximately 0.05–1.3/1000[9]. Kart *et al*[10] reported 200 cases of ectopic IUDs, 90 of which were located in the bladder. Goldbach *et al*[11] reported a higher incidence of ectopic Multiload Cu375 (MCu) II functional IUDs compared to other IUDs. Sun *et al*[12] suggested that the MCu II IUD was similar to the V-type IUD as both have sharp side walls that easily distort when the device is handled or inserted incorrectly. The mechanism of IUD displacement is unclear but may be related to breastfeeding, the proximity of IUD implantation to recent delivery (up to 36 wk), surgeon's experience and skill in implanting IUDs, or a history of cesarean section[13]. Esposito *et al*[14] proposed two mechanisms for IUD displacement, which included immediate perforation during insertion and a secondary process of gradual erosion.

Clinically, bladder injury caused by an IUD may present with dysuria, hematuria, and lower abdominal pain[15]. Most patients with IUDs have a medical history of urinary tract infections or hematuria for which they have received treatment. As reported, urinary tract infections are the most common manifestation of bladder perforation with an IUD. For patients with a history of IUD implantation, recurrent urinary tract infections or intermittent hematuria should increase the suspicion for an ectopic IUD. The diagnosis of an ectopic IUD in the bladder mainly depends on imaging examinations. B-mode ultrasonography can be utilized for screening, but a definitive diagnosis requires a CT, cystoscopy, or hysteroscopy. There is currently no standard surgical treatment for this condition. Displaced IUDs can be optimally managed through hysteroscopy, cystoscopy, laparoscopy, or a combination of these procedures, with the location of the ectopic IUD determining the treatment option[13,16-18]. A recent study proposed an innovative combination of carbon dioxide cystoscopy and laparoscopy for IUD removal with a partial cystectomy[17].

A review of the current literature indicated that patients with bladder stones caused by ectopic IUDs should undergo preoperative cystoscopy, hysteroscopy (or transvaginal ultrasound), and CT imaging to determine the location of the IUD and facilitate surgical planning[19]. In the present case, the V-type IUD was only displaced approximately 1 cm into the bladder. Cystolithiasis occurred in this short segment, but the majority of the IUD was still located in the uterine cavity. We elected to use a holmium laser to break the calculi on the portion of the IUD in the bladder, and then removed the IUD through the vagina.

CONCLUSION

In conclusion, we reported a case of an ectopic IUD in the bladder that was documented seven years after IUD insertion. Among women of childbearing age with a history of IUD placement, repeated lower urinary tract symptoms, and hematuria, an ectopic IUD in the bladder should be considered. Ultrasound or CT can be used to confirm the diagnosis. Cystoscopy and hysteroscopy should be performed to guide surgical treatment. Removal of the ectopic IUD through the urethra or vagina is the least traumatic course.

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Figure Legends

Figure 1 Preoperative computed tomography images. Preoperative computed tomography demonstrates an intrauterine device protruding forward through the uterus and into the bladder.

Figure 2 Cystoscopy and hysteroscopic images of an ectopic intrauterine device. A: Cystoscopy reveals an intravesical device with many attached stones embedded in the bladder wall; B: Hysteroscopy demonstrates a V-type intrauterine device embedded in the myometrium of the anterior wall of the cervical canal.

Figure 3 Intrauterine device. Photograph of the intrauterine device after removal from uterus.

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