CASE REPORT





Intrauterine device (IUD) migration completely into the abdominal cavity and half into the bladder to form a stone: a case report and mini-review

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Abstract

The intrauterine device (IUD) is an important and highly effective means of contraception. Migration of the IUD, post implantation, out of the uterus is an infrequent complication, and its subsequent migration into the urinary bladder with formation of secondary bladder calculi, is even more infrequently reported. The authors report a 51 year old woman who had had her last child delivered via cesarean section 16 years ago. She underwent an IUD insertion in the next few months but was subsequently lost to follow up. Before detection of the ectopic state of the IUD she complained of dysuria and dyspareunia for two weeks. Clinically detected suprapubic discomfort on palpation. After a series of imaging studies and cystoscopy, the presence of an IUD stump with stones attached to it in the patient's bladder were confirmed. Cystoscopy followed by laser lithotripsy of the calculus was performed, as the first step in the treatment. After failure to remove the IUD cystoscopically, further cystotomy was made, however one side end of the cap structure of the IUD could not be located, necessitating abdominal exploration and irrigation till retrieval in totality. The patient made an uneventful recovery.

The case report emphasizes the importance of excluding uncommon etiolgies like ectopic IUDs as a cause of immobile adherent bladder calculi in women. Complete removal necessitates good preoperative knowledge of the type of IUD, as structural degradation might lead to separation of its components. An adequate consent for a possible exploration of the abdomen in case of a missing component should also be taken.

Keywords Bladder calculus, Ectopic, Endoscopy, Intrauterine device migration

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Background

The IUD as a method of contraception is widely accepted globally because of a number of advantages, including safety, effectiveness, simplicity, and reversibility [1]. IUD perforation is a very rare complication of IUD placement. The incidence stands at $0.05/1000 \sim 13/1000$ [2]. The IUD perforation can be categorized as partial, with varying degrees of part of it being within the uterine wall [3] or complete, entirely within the abdominal cavity. The incidence of IUD perforation and penetration into the bladder is an even rarer occurrence.

In China, the use of IUD, as a birth control measure is very high [4]. Inspite of the low incidence of perforation, the sheer volumes involved necessitate gaining knowledge about complications of perforation. The most common area of the ectopic site implantation of an IUD is the bladder [5], however other areas, such as the small bowel, large bowel, ureter, urethra, ovary, rectum, and appendix [6–12], have also been involved. Since most IUD migration occurs deep within the body, the symptoms do not help in localization. Therefore imaging studies guide us towards their localization [13]. There are many ways to remove an ectopic IUD, including transurethral and vaginal endoscopy, laparoscopy and open surgery, and the procedure with minimal morbidity should be chosen.

Case description

- 51-year-old woman with a BMI 26.6 kg/m², presented with dysuria of 2 weeks duration. She had given a history of being treated for UTI (urinary tract infection) in the last few days, but had no relief. She also gave a previous history of IUD implantation at a local hospital an year after her cesarian section 16 years ago. She dictated that she had a T-shaped IUD. Immediately post IUD implantation, she had minor vaginal bleeding for 2 weeks, which had subsided. Patient had not followed up thereafter for removal of the IUD. She also revealed that she had been detected to be diabetic since the last year, but her sugars were well controlled.
- Clinically she was afebrile. Suprapubic pain was present on palpation. Her urine examination showed a positive Leucocyte Esterase 4+, large number of RBCs and WBCs. Her sonography showed a bladder calculus, non mobile measuring 23 mm*12 mm (Fig. 1A). Office cystoscopy confirmed a yellowish oval non mobile, adherent calculus (Fig. 1B). With a history of previous IUD placement and loss of follow up, non-mobile calculus in the bladder, a strong suspicion of misplaced IUD in Bladder with a secondary calculus was on the cards. Multislice CT scan of pelvis revealed a cystic bulge in the right posterior wall of the bladder with a striated,

dense shadow and tubular structures extending to the uterine fundus behind the bladder stone (Fig. 1C and D). A diagnosis of displacement of the IUD to the bladder and subsequent bladder stone formation was made. Patient was planned for cystoscopic management to fragment the calculus using holmium laser lithotripsy and subsequent IUD removal.

Surgical treatment process and intraoperative problems

Patient was taken up for surgery under GA. Initial transurethral laser fragmentation and Ellik evacuation of stone fragments revealed one end of the IUD visible in the bladder lumen(Fig. 2A). Simple forceps removal of the end was not possible as it appeared to be adherent. A decision to convert to open was taken, and after a Pfannenstiel incision, extraperitoneal cystotomy was done and IUD retrieved. During careful examination of the retrieved sample, it was found that the end cap towards the bladder end of the copper wire IUD was missing. The IUD type we took out was Love mother functional IUD: V-shaped stent made of memory alloy material, with a copper head at the tip of each arm on both sides, soft and plastic at low temperatures, and able to return to its original shape at body temperature (Fig. 2B). Since her uterine serosal surface did not show any perforation, the missing end cap must be in the peritoneal cavity. Vigorous peritoneal lavage was done and it re-surfaced, as it was probably lying free in the peritoneal cavity (Fig. 2C). A urinary catheter, pelvic, and abdominal drains were then placed, and the abdominal incision was closed. Post op period was uneventful with sequential removal of drains and urinary catheter in 2 weeks time. Patient was completely cured of her symptoms in 3 weeks time.

Discussion

IUD implantation is widely used as a safe and effective method of contraception. 13.9% of the 1.16 billion women of childbearing age use IUD worldwide. Among 269 million women of childbearing age in China, the use rate of IUDs is as high as 40.6% [14].

There are 2 main mechanisms of IUD migration. Firstly migration via acute uterine perforation caused by improper insertion by the health care worker, and secondly, chronic secondary perforation occurring slowly like a uterine ectopic [15], predisposed by the softer post pregnancy state [16], or chronic inflammation of the uterine wall [17]. Our patient's perforation in this case may have been caused by implantation of the IUD post cesarean section, and prolonged.

The surgical management for IUD related bladder calculi begins with cystoscopic extraction of the calculus followed by a gentle attempt at endoscopic removal of the IUD [18]. If the IUD is predominantly extravesical



Fig. 1 Imaging results. (A) Ultrasound of the urinary system: A bladder stone is visible (black arrow); (B) Cystoscopy: Stone are stable on bladder flushing; (C) Multislice CT scan of the pelvis: Stone and tubular structure in the coronal position (black arrow); (D) Multislice CT scan of the pelvis: Stone and tubular structure suggests scar formation between the bladders of the uterus

with unclear relationship with the surrounding organs, a laparoscopic/open approach should be preferred [19]. In smaller degrees of migration, Ultrasound-guided hysteroscopic procedures are also effective [20]. Reports of the IUD breaking during removal [21-23], or separation of its components due to degradation of its physical structure, are also present. To prevent, inadequate removal during surgery, detailed information about the type of IUD implanted should be obtained preoperatively. Our patients' IUD's cap structure separated from the main body of IUD, however the same was subsequently retrieved. If the end cap evaporates during laser cystocentesis or during surgery If the end cap is not found even after irrigation. We should check for caps in the sewage bucket at the time of surgery or can do an intraoperative CT to detect the location of the missing end cap in the abdominal cavity.

Some aspects worthy of consideration to prevent ectopic migration of IUD include choosing the right type of IUD, with its insertion by a clinically experienced HCWs [24]. Levonorgestrel IUD has been reported less likely to perforate than copper IUD [25, 26]. A proper follow up is required after implantation, and if appearing to migrate, it should be selectively removed.

Conclusion

Although the IUD has many advantages for contraception, such as economy and convenience. the complications associated with IUD, especially ectopic IUD, cannot be ignored. A close follow up is therefore, warranted. If secondary bladder calculi form, these should be distinguished from ordinary bladder calculi, by their immobility and adherence to the mucosa. All efforts to remove the IUD intact, should be made, even if transabdominal exploration is warranted.



Fig. 2 Surgical treatment process. (A) A holmium laser is used to fragment the stone, IUD wrapped around bladder stones (black arrow); (B) Dropped cap structure during surgery (black arrow); (C) Retrieved "V"-shaped IUD. IUD, intrauterine device (black arrow)

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Author contributions

FY and MC drafted the manuscript and reviewed the literature. HC and GY helped with the draft. YW and WW revised the manuscript. All authors reviewed and approved the final manuscript.

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Data availability

The original contributions presented in the study are included in the article material, further inquiries can be directed to the corresponding author.

Declarations

Ethics approval and consent to participate

This institution does not require Institutional Review Board approval for case reports. Considering the ethical principles, the patient's name was not mentioned in the paper.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Clinical trial number

Not applicable.

Competing interests

The authors declare no competing interests.

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