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Case Report

Migration of an intrauterine device into the urethra with calculi formation: a case report

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Abstract: Intrauterine device ectopia is not common in clinical practice, the incidence of Intrauterine device perforation is about 0.8-1.4/1,000 insertions, and Intrauterine devices migrate into the urethra with the formation of stones is even more rare. As there are lots of differences in the clinical manifestations of Intrauterine device ectopia, most patients have no positive symptom, the diagnosis is mainly dependent on imaging methods. The early treatment of abdominal Intrauterine device ectopia is mainly based on open surgery. With the development of laparoscopic techniques including laparoscopy, hysteroscopy, and ureteroscopy, endoscopic removal of ectopic Intrauterine device becomes the preferred treatment as it is safer and trauma less. In this case, we successfully treated a urethra migrated Intrauterine device with stone formation by ureteroscopic lithotripsy, and completely removed the T-type Intrauterine device and its stone.

Keywords: Calculi, hematuria, intrauterine devices, ureteroscopy, uterine perforation

Introduction

Intrauterine device (IUD) can perforate through vaginal or uterine wall and migrate to different places of body for many reasons. If IUDs migrate into the urinary system, it may leads to many urinary symptoms such as urgent micturition, hematuria, pyuria etc. Here we discuss a case of IUD perforated into the urethra, accompanied by stone formation, which then resulted in lower urinary tract obstruction and hematuria.

Case presentation

A 37-year-old, gravida 4, woman was admitted to our outpatient clinic with a white and hard foreign body found outside the urethral meatus for 3 months. Her history revealed that she had been suffering from urgent micturition, intermittent hematuria, bleeding after coitus for 2 years. These symptoms can be alleviated by antibiotic treatment. She had just natural delivered a term infant 3 months ago with the IUD in place, since then the foreign body was found outside the urethral meatus. The T-type IUD had been placed by a gynecologist for 12 years. Physical examination did not find significant positive signs, but the gynecological examination found outside the meatus of the urethra a white hard stone with diameter of about 6 mm. The vagina was unobstructed and smooth, but the IUD string was not seen outside the cervix. Gynecological ultrasonography showed that the uterine size was 59*46*56 mm with endometrial thickness of about 13 mm. The missing IUD was not seen in the uterus and cervix. Ovaries were in normal shape and no effusion in pelvic. Plain film of kidneys, ureter and bladder (KUB) pointed a T-shaped high-density shadow at the level of 5th lumbar, about 8*5 mm in dimension (**Figure 1**). A further examination of pelvic computed tomography (CT) revealed the high-density shadow with diameter of about 11 mm under the pubic symphysis. Its position was low and may involve the upper vaginal and urethra (**Figure 2**). Microscopic examination of urinary white blood cell was ++ (normal value: NEGATIVE) and urine culture was negative. Based on the evidence above, we speculated that the IUD migrated into the bladder, leading to the formation of urethral calculi, and further lead to lower urinary tract obstruc-

Figure 1. The plain film of KUB shows clearly that the calculi encapsulates one collateral branch of T-type IUD (red arrow).

Figure 2. On pelvic CT, the IUD can be seen partially sunk into the neck of bladder (red arrow).

tion. Considering the IUD may have perforated the anterior vaginal wall and bladder posterior wall, violent removal may cause urethral vaginal fistula. Therefore, the goal of this surgery was to avoid urethral fistula firstly, then try to remove stones and the IUD to the greatest extent, blindly removing the IUD should be forbidden. Ureteroscopy was planned and holmium laser lithotripsy was prepared. We managed into the bladder through the stricture between the stone and the urethral orifice. The blue string of T-type IUD was found between the lower urethra and vesical neck. The copper ring of the IUD had been corroded partially. The trunk of the T-type IUD was located in the urethra. One branch was completely wrapped in the stone while the other side was deep into the urethral mucosa, not perforating the urethral muscle layer yet. Excluding the possibility of perforation, we gently free the margin of the stone by hand. Finally the IUD was removed as

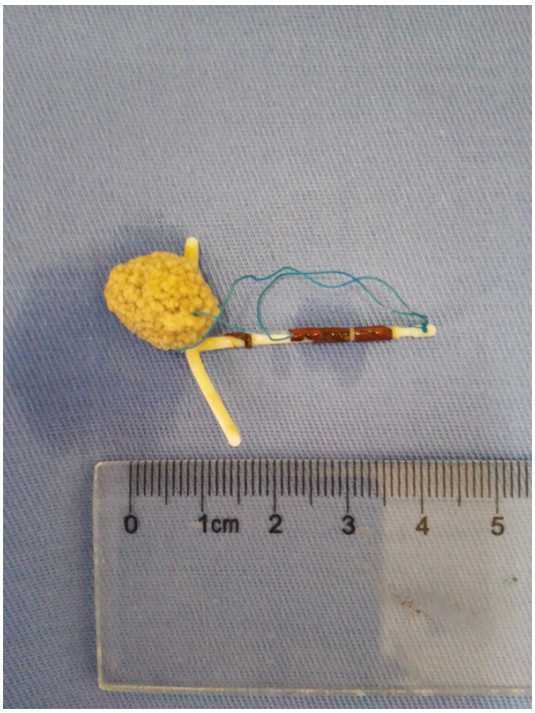

Figure 3. The integrate specimen of T-type IUD with calculi.

a whole (**Figure 3**). The 16F urinary catheter was indwelled for 2 weeks to promote sinus healing, and further to prevent urethral fistula.

Discussion

IUDs are currently used worldwide as an effective contraceptive method, but it is not absolutely safe. IUDs can cause many complications including intrauterine infection or bleeding, IUD perforation or expulsion, pregnancy with the IUD in place [1].

The incidence of IUDs perforation in clinical practice is about 0.8-1.4/1000 insertions. Some studies have shown that the possible ectopic sites include greater omentum (26.7%), Douglas pouch (21.5%), colonic lumen (10.4%), myometrium (7.4%), broad ligament of uterus (6.7%), peritoneal cavity (5.2%), small intestine serosa (4.4%), colonic serosa (3.7%) and mesentery (3%), bladder, groin, ovary and other places with perforation are relatively rare [2]. The major reasons for the IUDs perforation lie in the following five aspects: 1) Operators who place the IUDs are inexperienced, the IUD can be stuck into the endometrium by reckless operation [3]; 2) The uterine wall gets thin and

soft because postpartum uterus has not fully recovered. It gives chance for IUDs to penetrate the uterine wall [4]; 3) Abnormal uterine structure, such as bicornate uterus, uterus retroposition, is more likely to induce local pressure overload and facilitate IUDs perforation; 4) The type of IUD does not match with uterine size which prones to IUDs perforation or expulsion; 5) Infection like endometritis weaken the uterine wall and make it easier for IUDs to be embedded in the myometrium [3, 5]. In this case, the patient was pregnant with the IUD in place. As the uterine wall was weak and intrauterine pressure increasing during natural labour, the IUD perforated the myometrium into the bladder. With the involution of uterus after childbirth, the myometrium thickening and perforation site gradually closed.

As there are lots of differences in the clinical manifestations of IUD ectopia, most patients have no positive symptoms, the diagnosis is mainly dependent on imaging methods. For suspected IUD ectopia, the combined use of gynecological ultrasound and abdominal X-ray film is usually a very effective way to make a diagnosis. If the medical institutions are not equipped with professional gynecological ultrasound, abdominal X-ray film can be used to identify IUD ectopia and expulsion. For patients admitted to surgery, CT and MRI is a further assessment of the relationship between IUD and the surrounding organs, which gives more advices to the choice of surgical approaches [6]. In addition, the gynecological examination is also important. When the IUD string was not seen outside the cervix, the IUD ectopia should be taken into account.

The early treatment of abdominal IUD ectopia is mainly based on open surgery. With the development of laparoscopic techniques, endoscopic removal of ectopic IUD becomes the preferred treatment as it is safer and trauma less. Almost all of the abdominal ectopic IUDs, although some have serious adhesion with the surrounding tissue, can be effectively treated by laparoscopy [2, 6]. For the IUDs which partially embedded in the myometrium, the use of non-invasive hysteroscopy can be more convenient to remove it. In this case, the IUD perforated into the bladder and accompanied by stone formation. So we sent an ureteroscope into the bladder through the stricture between the stone and the urethral orifice. Holmium laser lithotripsy was prepared. After the T-type IUD and calculi were clearly observed, we gently free the margin of the stone by hand and removed the IUD as a whole.

In conclusion, IUDs are safe and effective reversible contraceptive measures. However, the clinical symptoms of IUDs ectopia are not obvious and always overlooked by patients. We recommend the IUD inserted patients take gynecological examinations regularly. For patients with suspected perforation, gynecological ultrasound, abdominal X-ray and other imaging methods should be used timely. The discrimination between perforation and expulsion is also very important. Surgical removal is still the first choice for IUD perforation. The clinical cure rate is approaching one hundred percent with the integrated use of laparoscopy, hysteroscopy, ureteroscopy and so on [2, 7].

Disclosure of conflict of interest

None.

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