



Successful removal of an intrauterine device perforating the uterus and the bladder with the aid of a transurethral nephroscope

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Abstract

Aim An IUD perforating the uterus and bladder and creating a nidus for stone formation is a rare complication. We aim to demonstrate with a video a novel surgical technique that involves transcervically extracting a perforating IUD with a transurethral nephroscope after removal of the bladder stone on the IUD.

Methods A 57-year-old woman was referred to our department 4 months ago following a 2-year history of suprapubic pain at the end of urination. Ultrasound and X-ray examination confirmed an IUD perforating the uterus and the bladder. The patient underwent transurethral holmium laser lithotripsy and transcervical removal of the IUD with the aid of a transurethral nephroscope.

Results The stone on the perforating ectopic IUD was successfully removed and the IUD was extracted without complications.

Conclusion This video demonstrates a rare case of an IUD that perforated both the bladder and the uterine walls and created a nidus for stone formation in the bladder. The surgical technique involved in removing the stone and extracting the IUD is a new approach to treating this problem. It is suspected that this specific surgical intervention may also help to minimize the formation of a larger vesico-uterine fistula by decreasing the extent of trauma potentially created when extracting the IUD. However, this supposition merits further study.

Keywords IUD · Perforation · Bladder · Transurethral nephroscope

Aim of the video

An IUD perforating the uterus and bladder and creating a nidus for stone formation is a rare complication. We aim to demonstrate with a video a novel surgical technique that involves transcervically extracting a perforating IUD with a transurethral nephroscope after removal of a bladder stone on the IUD.

Laparotomy or laparoscopy has been typically performed in cases involving partial perforation of an IUD for removal of the device and for the surgical repair of the associated defect [1, 2]. Previously, we reported a case of an M-shaped IUD partially perforating into the bladder without calculus formation, with successful removal by hysteroscopy [3]. However, in this present case, a calculus appeared around the IUD segment, which had penetrated into the bladder cavity. We aim to demonstrate with a video the surgical techniques in which a transurethral nephroscope is used to manage this clinical presentation.

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Patient and methods

A 57-year-old woman, gravida 2, para 1, with a 2-year history of suprapubic pain at the end of urination episodes, was referred to our department for further investigation. She had no other symptoms or any other significant physical findings, including no evidence of urinary tract infections. Twenty-six years previously, a copper-T IUD had been inserted into her

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uterus immediately following an uncomplicated vaginal delivery. Two years later an unexpected pregnancy occurred and an elective suction abortion was performed. During the surgery, the IUD was not detected so it was assumed that it had fallen out. When the patient again presented 26 years later for evaluation of persistent suprapubic pain, a transabdominal ultrasound was performed, which showed a linear hyperechoic foreign body located in the lower part of the uterine cavity with a portion penetrating through the anterior uterine wall into the posterior supratrigonal bladder wall. To ascertain the type of foreign body identified by ultrasound, a plain abdominal X-ray was performed, which confirmed the presence of a T-shaped IUD in the pelvis. It also revealed calculus formation on the tip of the penetrating IUD.

Under general anesthesia, an F-20 offset nephroscope was placed under direct vision through the patient's urethra into her bladder. The bladder was visualized and noted to have a foreign body protruding from the left posterolateral wall. It was encapsulated by a needle-like calculus measuring $1 \times 1 \times 1$ cm. Under direct vision, a hysteroscope was placed into the uterine cavity transcervically. It detected a downward shifted IUD with the vertical limb and one horizontal limb located in the lower part of the uterine cavity, while another horizontal limb protruded through the anterior uterine wall. Although obscured by the calculus formation, we suspected that the foreign body protruding into the bladder was the other horizontal limb of the IUD. An attempt was made to remove the calculus encapsulating the IUD segment in the bladder. A 365-Km Holmium laser device was passed through the working channel of a nephroscope transurethraly. The calculus was fragmented using the laser, with successful and complete removal of the stone without complications. After removal of the calculus, it was confirmed that the protruding segment into the bladder was part of the IUD. After dilatation of the cervix, the F-20 nephroscope was placed under direct vision through the patient's cervix into her uterine cavity. The vertical limb of the IUD was grasped with forceps. Using gentle traction, the IUD was slowly extracted without any visible bleeding. The site of perforation narrowed after removal of the IUD and eventually healed with the aid of bladder rest using an indwelling transurethral Foley catheter for a period of 2 weeks. On follow-up evaluation, the bladder wall was well healed with no subsequent evidence of residual perforation or fistula.

Results

The ectopic IUD was successfully removed. The patient had follow-up visits at 4 weeks and at 4 months. The patient had no signs or symptoms of persistent bladder or uterine abnormalities at the latter follow-up visits, including no clinical evidence of infections or fistula formation.

Conclusion

This video demonstrates a rare case of an IUD perforating both the bladder and uterine walls and formation of a calculus on the protruding segment in the bladder. Because the junctional portion of the IUD was located in the intra-uterine cavity, we initially considered attempting to remove the device using a transcervical approach to minimize risk to the patient. However, a calculus was noted on the protruding segment in the bladder cavity. We alternatively chose to use a nephroscope, which enabled us to safely and effectively remove the calculus and extract the IUD using a Holmium laser and grasping forceps respectively. This technique, however, is dependent on obtaining adequate visualization of the IUD in both the bladder and the uterus and a device that is amenable to being safely extracted using this method. Although we chose to use a nephroscope, we acknowledge that other urological or gynecological instruments, such as a short ureteroscope or cystoscope, may have had comparable efficacy with the nephroscope. In addition, it is possible that a regular pneumolithotripter (or ultrasonic lithotripsy) could have been used instead of the holmium laser, presumably with comparable effectiveness. Use of the widest device that can be handled comfortably and safely is recommended, as the endoscopic channel is wider and the forceps necessary for extraction are typically stronger.

This minimally invasive surgical approach to managing a perforated IUD with calculus formation may be a safe and effective option for the management of IUD-related bladder perforations. Based on the results of this surgical intervention, it may be prudent to initially consider the feasibility of endoscopic extraction of an IUD that has migrated, given the low morbidity associated with such an approach rather than more invasive surgical interventions.

Compliance with ethical standards

Conflicts of interests None.

Consent Written informed consent was obtained from the patient for publication of this video article and any accompanying images.

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