Accessed on: http://jkb.ub.ac.id/index.php/jkb/article/view/3261
Jurnal Kedokteran Brawijaya Vol. 32, No. 2, Agustus 2022, pp. 138-141
Article History: Received 22 June 2022, Accepted 13 August 2022

Research Article

Calculus Formation in Bladder from Migrated Intrauterine Devices

Pembentukan Kalkulus di Kandung Kemih dari IUD yang bermigrasi

Mangkubumi Putra Wijaya, Kurnia Penta Seputra, Besut Daryanto, Taufiq Nur Budaya
Department of Urology Faculty of Medicine Universitas Brawijaya Malang

ABSTRACT

Migration of the intrauterine device (IUD) into the bladder has been a rare case. There were reported 31 cases of IUD migration into the bladder until 2006. Although IUD migration is asymptomatic, it should be removed to prevent complications such as pelvic abscess, bladder or intestinal rupture, and adhesion. A 52-year-old woman came to the urology clinic with pyuria since the previous 3 months. She had a history of IUD insertion in 1982; and two months later, she got pregnant. Since 2015, she has suffered from dysuria but has never been treated and has worsened in the past 3 months. On physical examination, tenderness was found in the suprapubic region. The results of urinalysis showed pyuria and hematuria. The ultrasonography findings, there were large bladder stones. An abdominal x-ray revealed the presence of a bladder stone with the IUD tail. Vesicolithotomy was performed and the IUD was found attached to an 11x7 cm bladder stone. The patient had a good postoperative condition without any special complications. The IUD in the bladder is a medium for forming secondary bladder stones. Most cases of IUD migration are caused by a lack of evaluation after the installation procedure. This case suggested that the physician should be more careful in carrying out the installation procedure. It is necessary to evaluate the location of the IUD after installation to prevent further patient complications.

Keywords: *Bladder stone, intrauterine device, vesicolithotomy*

ABSTRAK

Migrasi alat kontrasepsi dalam rahim (IUD) ke dalam kandung kemih merupakan kasus yang jarang terjadi. Dilaporkan 31 kasus migrasi alat kontrasepsi dalam rahim sampai tahun 2006. Meskipun migrasi AKDR asimtomatik, AKDR harus diangkat untuk mencegah terjadinya komplikasi seperti abses panggul, ruptur buli atau usus, dan adesi. Seorang wanita berusia 52 tahun datang ke poli urologi dengan keluhan pyuria sejak 3 bulan yang lalu. Pasien memiliki riwayat pemasangan IUD pada tahun 1982, dua bulan kemudian, pasien hamil. Sejak tahun 2015 mendertia nyeri berkemih namun tidak pernah berobat dan semakin memburuk dalam 3 bulan terakhir. Pada pemeriksaan fisik ditemukan nyeri tekan pada regio suprapubic. Hasil urinalisis menunjukkan pyuria dan hematuria. Pada ultrasonografi, terdapat batu buli yang besar. Pada abdomen x-ray menunjukkan adanya batu buli dengan ekor IUD. Dilakukan vesikolititimi dan ditemukan AKDR menempel pada batu buli berukuran 11x7 cm. Pasien memiliki kondisi pasca operasi yang baik tanpa komplikasi khusus. IUD di buli merupakan media untuk pembentukan batu buli sekunder. Sebagian besar kasus migrasi IUD disebabkan oleh kurangnya evaluasi setelah prosedur pemasangan. Penting untuk mengevaluasi lokasi IUD setelah pemasangan untuk mencegah komplikasi pasien lebih lanjut

Kata Kunci: Batu buli, perangkat intrauterine, vesikolitotomi

Correspondence: Mangkubumi Putra Wijaya. Department of Urology Faculty of Medicine Universitas Brawijaya Malang, Jl. Veteran 65145, Malang, Indonesia Tel. 085736351717 Email: putra_wijaya12@yahoo.com

DOI: http://dx.doi.org/10.21776/ub.jkb.2022.032.02.11

INTRODUCTION

Corpus alienum in the bladder is a strange finding faced by urologists and general surgeons (1). Corpus alienum in intra bladder or intra urethra is usually found due to iatrogenic trauma, self-inclusion, sexual harassment, criminal activity, and migration from adjacent organs, even though migration from adjacent organs is rare. Many kinds of corpus alienum reported include electrical wires, wooden sticks, thermometers, bullets, intrauterine contraception devices, and knotted suprapubic catheters. There were reported 31 cases of IUD migration into the bladder until 2006 (1,2). In genereal, patients present with hematuria, pain in the pelvic area, and bladder stone formation.

Intrauterine devices (IUDs) are a type of contraception often used in the world (3). The success rate of installation and as a contraceptive is very high (4). Our case report is a rare case where the success rate of IUD installation is high, but the patient suffered from IUD migration into the bladder and experienced bladder stone formation. This case was very interesting, especially as the development of cases in the world of urology and as an evaluation and control for the IUDs installation.

CASE REPORT

A 52-year-old woman came to the urology clinic with pyuria since the previous 3 months. Since 2015, she has suffered from dysuria but has never been treated and worsened in the past 3 months. The patient had a history of intrauterine device (IUD) insertion in 1982 or 36 years ago. The IUD that has been used was the non hormonal lipes loop IUD. After the patient did an IUD insertion, she never went to an obstetrician or midwife for a further follow up. The patient never had an ultrasound examination. Two months after the IUD installation, the patient got pregnant. The patient gave normal delivery process to her baby even though the baby passed away at the age of 2 months. The patient did not know why the baby passed away at that time. Patient had 2 children with history of pervaginal delivery.

On physical examination, tenderness was found in the suprapubic area. On urinalysis examination, there were pyuria, hematuria, leukocytosis, proteinuria, and bacteria (positive bacteria). On complete blood examination, normochromic normocytes anemia (Hb: 9.3g/dl; MCV: 88.4fl; 30.8pg), azotemia (blood urea: 58.6mg/dL; blood creatinine: 1.88mg/dL; BUN: 1.41mg/dL dL) were found. Ultrasonography revealed that there was a calculus in the bladder (Figure 1). In the KUB photo, there was a calculus in the bladder projection with an IUD tail (Figure 2).

Based on the history, physical examination, and supporting examination of the patient, vesicolithotomy was performed. After the vesicolithotomy procedure, an 11x7cm bladder stone was found with a smooth and flat surface. IUD was found embedded in the calculus (Figure 3). After surgery, the patient's condition improved with no pain when urinating; therewere no hematuria and pus found (Figure 2).

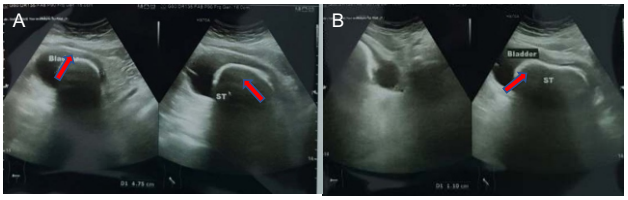

Figure 1. There was an acoustic shadow in Bladder from Ultrasonography

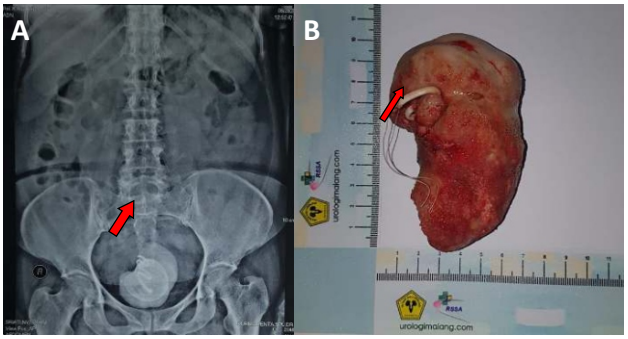

Figure 2. (A) KUB, the image resembles an IUD (arrow) surrounded by radiopaque shadow in the pelvic region (B) Post vesicolithotomy obtained bladder stones with a size of 11x7 cm with an IUD

DISCUSSION

Patients with corpus alienum in the bladder are usually asymptomatic and can present with hematuria (67.3%). Meanwhile, the second most common complaint is the frequency of urination and dysuria (59.1%) caused by irritation (10.2%), complaint of pelvic pain (10.2%), and urinary retention (6.1%) (5). There are sometimes systemic complaints, such as fever and anxiety. When a patient experiences anxiety disorders during anamnesis and urogenital examination, it must be suspected that the patient has a sexual disorder (6). The most frequent causes of corpus alienum found in the body are iatrogenic (40.8%), self-insertion of corpus alienum (34.6%), sexual harassment (8.1%), and migration from other organs (8.1%) (7).

Intrauterine devices (IUDs) are contraceptives widely used in the world. Complications of intrauterine devices included UTI, spontaneous abortion, and uterine rupture. IUD migration in the surrounding organs is very rare. From 165 cases the migrations include to the omentum (45 patients), to the rectosigmoid (44 patients), to the peritoneum (41 patients), to the bladder (23 patients), appendix (8 patients), small bowel (2 patients), adnexa (1 patient), and iliac vein (1 patient). Threads from the IUD are not commonly found in the cases of IUD migration to the surrounding organs (8). In this case, the patient had complained of dysuria since 3 years ago and weighed in the last 3 months. She also said that urine has been pushing since the last 3 months. The patient also said that after 2 months of the IUD installation, the patient claimed to be pregnant and gave birth to a child. While in the physical examination, tenderness was found in the suprapubic.

According to the history and physical examination, the patient had a corpus alienum in the bladder.

The main mechanism of corpus alienum in the bladder is the insertion through the urethra, or corpus alienum that is forced up to reach the bladder (1). This study was highly related to the urethra of women. The urethra is short, so it facilitates access to reach the bladder without any difficulty. In addition, due to low visibility, corpus alienum can be inserted into the urethra during masturbation.

The mechanism of perforation and IUD migration from the uterus is still unknown. Factors affecting IUD migration included the uterus size, the uterus position, and insertion time (7). The presence of copper in a hollow organ can cause adhesion formation. This is more common in the thinning uterine wall, lactation and post-partum periods, strong uterine contractions, the presence of congenital anomalies, and previous cesarean section history. The strong contraction of a bladder can also cause spontaneous migration of an IUD associated with improper placement of the IUD. In this case, an adequate placement can prevent perforation (9).

The risk factors mentioned in this case, including strong contractions of the uterine due to labor or sexual stimulation, irregular contractions of the bladder and the inflammatory effects of the IUD, can explain the mechanism of gradual migration by the IUD. The pathogenesis of uterine perforation by an IUD can be caused by two mechanisms. The first is perforation at the installation time and can be diagnosed with acute pelvic pain, bleeding, or loss of cords. The second expected mechanism is uterine perforation, which occurs gradually and spontaneously in the presence of risk factors explained by further developments, so that it can be asymptomatic (10,11).

In this case, IUD migration is almost possible due to perforation. The patient had a pregnancy two months after the IUD installation, which proved the loss of contraceptive effects or the IUD effect on the uterus. It is believed that the strong contractions of the uterus at the time of the disruption were the main determining factor. The presence of symptom-free intervals for 32 years showed that other factors such as sexual intercourse and the inflammatory effect of the IUD could facilitate migration due to differentiation in tissue consistency. Consequently, improper placement of the IUD was the first precipitating factor associated with perforation. The soft consistency of the uterus in labor, strong contractions at delivery, and sexual intercourse triggered all the inflammatory effects caused by the IUD. Therefore, patients must be assessed about their risk factors physically and with ultrasonography before insertion and post-insertion examination to prevent uterine perforation and other complications (12).

A similar study conducted by Van Ophoven et al. showed that corpus alienum in the bladder is most common through the ascending tract. The most common cause of inserting a corpus alienum into the genitourinary tract is sexual fulfillment or eroticism. A study by Rafique M in patients with transversal corpus alienum in the age group of 14-70 years, from which 10 of them were men, showed 7 patients (43.8%) with iatrogenic intravesical corpus alienum presentations, 5 patients (31.3%) with corpus alienum migrated from adjacent organs, and 4 patients (25.0%) with corpus alienum inserted by themselves into the bladder. These included copper wire, carrots, lead pencils, intrauterine devices, surgical gauze, Foley catheter pieces, and Teflon from the resectoscope casing (13). In those patients, intrauterine devices could migrate to the bladder due to errors in IUD installation.

Fe (iron) and Cu (copper) play a role as promoter for the formation of calcium oxalate stones. The mean urine Cu level in patients with urinary tract stones was 0.16±0.5ppm, significantly higher than healthy controls. The effect of Cu promoters on the formation of oxalate stones requires further observation because existing studies are only limited to finding levels in blood and urine (14). IUD users have a higher chance of developing bacterial vaginosis than the general population. A favorable anaerobic environment may form in the vagina, facilitating actinomy growth. In some cases, PID or pelvic abscess associated with actinomycosis is observed in women who have used an IUD for a long time. In the case of IUD migration into the urinary bladder, there might be an anaerobic bacterial infection that can be translocated into a urinary bladder accompanied by the copper content in the IUD, triggering the bladder stones formation.

Because antibiotics are not given continuously to control infections due to corpus alienum in the body, removing them from corpus alienum in the bladder is necessary. In many cases, treatment through transurethral is the first choice. If this fails, then a bladder incision can be done. Bladder perforation can occur in patients with large corpus alienum. A careful preoperative examination to detect characteristics of a foreign body must be carried out to avoid the risk of perforation of the bladder wall (15).

The supporting examinations carried out to prove corpus alienum are X-ray and ultrasound. An X-ray is done to interpret corpus alienum which has a metal-like density. This correlates with IUD material, where the IUD is made of copper. If an X-ray examination was done for copper, it showed radiopaque density. Ultrasound examination was performed to interpret superficial tissue. An ultrasound examination was performed to complete the X-ray examination, where the X-ray examination could not interpret the soft tissue. CT scan was rarely performed to diagnose patients with corpus alienum in the bladder. The main complaints about corpus alienum in the bladder are lower abdominal pain, hematuria, bladder irritation, and urinary tract infections. Bladder stones, in some cases, result in chronic cases. Plain abdominal radiographs and cystoscopy are standard examinations to diagnose and evaluate the presence of corpus alienum in the bladder, whereas CT and MRI can also be needed for some complex cases (16).

Patients with corpus alienum in the bladder are usually asymptomatic. Corpus alienum in the bladder can cause recurrent urinary tract infections (UTI), hematuria, calculus formation, and pelvic pain. Intrauterine device migration is most common in the peritoneum and rarely in the bladder. The most common mechanism of how it can be inserted in the bladder is usually forced by ascending track. Investigations that can be done are X-ray and ultrasound, while the gold standard is urethrocystoscopy. This case

gave a message to the physician to be more careful in carrying out the installation procedure. In addition, it is necessary to evaluate the location of the IUD after installation to prevent further patient complications.

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