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Case Report

Migration of intrauterine device to the bladder with associated vesicolithiasis: a case report

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ABSTRACT

Migration of intrauterine device (IUD) is a frequent complication of IUD insertion. Most IUD migration is only displaced in the uterine cavity, but in rare cases IUD could migrate to other pelvic organs, such as the pelvic cavity, rectum, or the bladder. We reported a case of 80-years old female with one month history of hematuria and pain, which further examination shows vesicolithiasis and bladder mass. During lithotripsy, intrauterine device was visualized inside the stone, which the patient admitted had been inserted 40 years ago. This case is remarkable, as it is rare to have a longstanding IUD placement with intravesical migration, vesicolithiasis, and bladder malignancy.

Keywords: Intrauterine device, Lithotripsy, Vesicolithiasis

INTRODUCTION

Migration of intrauterine device (IUD) is a frequent complication in IUD users. Approximately 25% of patients with IUD will experience IUD displacement sometime in their life. Generally, IUD is only displaced in the uterine cavity.[1] In some cases, IUD can cause perforation of the endometrial wall, causing migration of IUD into the myometrium, or even causing total migration of the IUD into intraabdominal cavity.

The female pelvic cavity contains several organs, such as the uterus, bladder, parts of the descending colon, and rectum. In females, the uterus may be normally anteflexed, retroflexed, or may even be rotated during pregnancy. Due to the close proximity of the uterus and other peritoneal organs, it is also possible for IUDs to perforate adjacent organs such as the peritoneum, the alimentary tract, or even urinary bladder.[1] In this case report, we described a case of intravesical migration of intrauterine device which leads to the formation of bladder stone.

CASE REPORT

An 80-years-old female presented with one month history of hematuria and pain during micturition. Patient complained that previously, episodes of hematuria resolve spontaneously but for one day before, hematuria was associated with pain during micturition and clots of blood in urine. Patient had a history of incomplete emptying, frequency, urgency, and nocturia. Physical examination revealed bleeding on external urethra. Upon urinary cathether placement, gross hematuria was visualized in the urinary bag. Abdominal ultrasound revealed vesicolithiasis with intravesical blood clot and urinary bladder mass. Urinalysis revealed 15-18 cells per high power field and 8-10 erythrocyte per high power field. Laboratory examination revealed leukocytosis (19.900/µl), mild anemia (Hb 10.9 g/dL), and increased serum ureum and creatinine. Additional history revealed that 40 years ago, patient underwent procedure for IUD insertion but never came for IUD removal. Patient never had urologic or gynecologic complaint before episodes of hematuria. Patient had transurethral resection of bladder

tumor (TURBT) in another hospital for bladder tumor evacuation but histopathology assessment was not conducted.

Patient was then scheduled for urgent cystoscopy due to urinary retention and continuous bleeding. During cystoscopy, 500 grams of blood clot was evacuated, and 4cm of bladder stone was visualized. On lithotripsy and lasertripsy for stone evacuation, copper T IUD was visualized inside the stone. The procedure was uncomplicated and all calculi were evacuated. The intrauterine device was also evacuated during cystoscopy. Bladder stone composition analysis revealed that the stone was a calcium oxalate stone. After the procedure the patient was stable and symptoms were improved. Pathology result shows bladder necrosis with fibrosis and chronic inflammation. Patient was discharged and planned for monitoring for bladder malignancy.

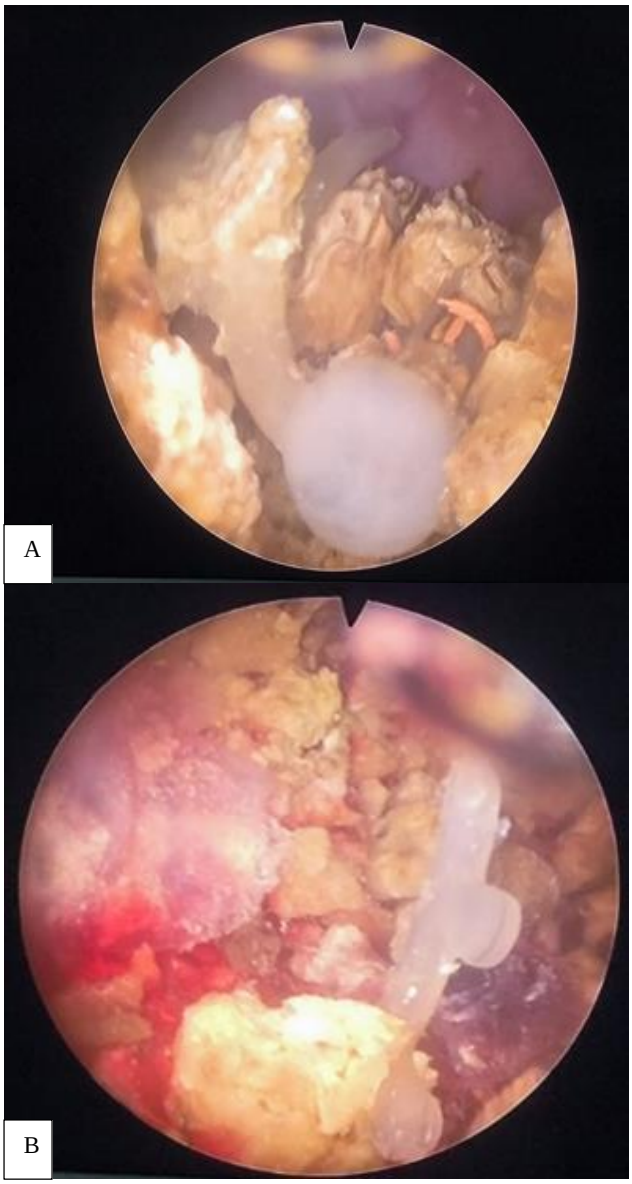

Figure 1 (A and B): Intraoperative view of the vesicolithiasis, left: copper T IUD is visualized.

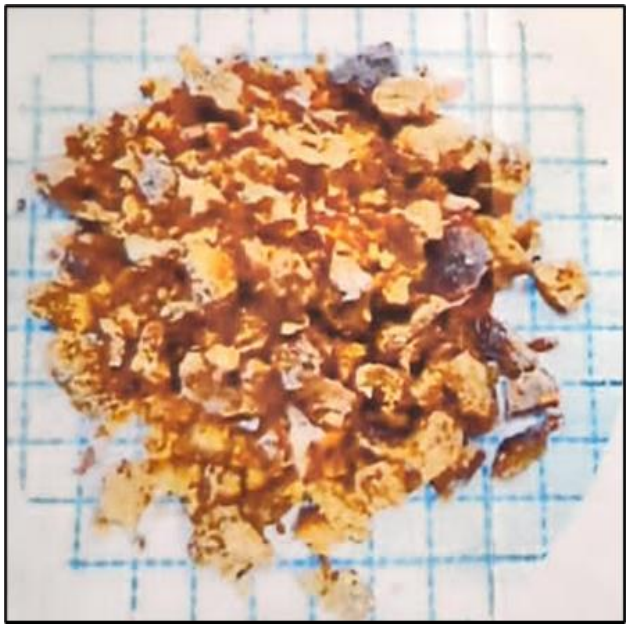

Figure 2: Bladder stone post extractionn.

DISCUSSION

Intrauterine device is widely accepted by women as a contraceptive method. The benefit of IUD is its relatively long effect of contraceptive and its low complication rate. IUD is also an effective method with cumulative 12-year failure rate of as low as 2.2%, which is similar to the effectivity of tubal ligation (1.9%).[2] This makes IUD a popular choice for contraception in women. However, there are several side effects associated with IUD usage, primarily increased prevalence of PID, increased menstrual blood and duration, and risk of perforation or displacement.[2]

Uterine perforation is one of the rare side effects of IUD usage. The prevalence of uterine perforation is approximately 0.4-2.2/1000 insertion for copper IUD, and 0.68-2.6/1000 for levonogestrel IUD.3 In most cases, patient presented with abdominal pain with or without bleeding. However, about a third of the cases have no symptoms and was incidentally discovered during abdominal examination or discovered due to contraceptive failure.[3]

There are two types of IUD perforation, partial and complete perforation. In partial perforation, the IUD perforates one or more layer of the uterus, which allows for an easier visualization of the IUD in the uterine cavity. In complete perforation, the IUD may remain near the uterus or could move within the abdominal cavity. The most common place for complete IUD perforation place is in the pouch of Douglas, although it is possible for the IUD to be located in other abdominal organs.[4]

Migration of intrauterine device into the urinary bladder is a rare complication of IUD insertion. Several reports of intravesical migration of IUD have been documented in

the literature. Dietrick et al reported a case of intravesical migration of Dalkon Shield type of IUD to the bladder, which was encased in calculus.[5] Another case report by Atakan et al reported a case of intravesical migration of IUD with symptoms of intermittent severe abdominal pain, urinary urgency, and increased micturition.[6]

About half of the reported cases of intravesical migration of IUD was associated with formation of calculi. The presence of IUD inside the bladder acts as growing point for calcium crystal in the bladder. Some authors have reported that foreign body inside the bladder. Julian et al[7] reported a case of urinary calculi growing from a surgical suture left behind the bladder. Other research has shown that indwelling catheter and ureteral stent also predispose patients to vesicolithiasis.[8]

In our case, the presence of IUD inside the urinary bladder acts as the growing point for bladder calculi. Our patient had history of IUD insertion 40 years before onset of symptoms. The longest forgotten intrauterine device which migrates to the bladder in the literature was reported by Dinkar et al which reported a patient with IUD migration to the bladder after IUD insertion 31 years ago.[9] The report also showed that the copper T IUD acted as a growing point for vesicolithiasis, which measured 48x14 mm. In our case, the size of the bladder calculi is significantly larger, with diameter of 40 mm across.

In our case, the stone was mainly composed of calcium oxalate. Calcium oxalate has been shown to be the easiest to crystallize in the presence of nidus, which could be other calcium oxalate crystal, uric acid crystal, or a foreign body. In most cases, initial formation of calcium oxalate crystal is due to superasaturation due to stasis, or due to the presence of urethrolithiasis that travels to the bladder. In our case, the copper T IUD acts as a growing point for calcium oxalate crystal.[10]

Urinary stone can also arise from urinary tract infections. Usually, infection stones consist of magnesium ammonium phosphate, carbonate apatite, and monoammonium urate crystals. In our case, a slight portion of the stone consisted of carbonate apatite crystal, which signifies the presence of urease-producing gram-negative organism. These organisms hydrolyze urea, which produces ammonia and carbon dioxide, which then hydrolyzed to become ammonium ion and bicarbonate. These ions then will bind with cations abundant in urine, and form carbonate apatite crystals.[11]

In some cases, intravesical migration of IUD resulted in no symptoms. The case of Dietrick et al and Dinkar et al resulted in no symptoms before the symptom of vesicolithiasis manifested.[5,9] In our case, the patient complained of symptoms generally associated with vesicolithiasis, namely hematuria and pain during micturition. However, the patient has no symptoms within the 40 years of inserted IUD.

In our case, vesicolithiasis was complicated with fibrosis, necrosis, and chronic inflammation of the bladder, and suspicious mass was visualized after removal of bladder stone. We speculated that the presence of bladder stone and chronic infection resulted in chronic inflammation of the bladder, which contributed to the development of cancer. Histopathological result shows fibrosis and bladder tissue necrosis. Although the result of the histopathology does not show typical bladder cancer morphology, the presence of bladder fibrosis, necrosis, and chronic inflammation increases the risk for bladder cancer.[12]

Bladder stone is a well-known risk factor for bladder cancer. The presence of calculi inside the bladder resulted in repeated injury of the bladder mucosa. Several other conditions that cause repeated injury to the bladder mucosa, such as recurrent urinary tract infection, chronic bladder obstruction, indwelling urinary catheter, and exposure to cyclophosphamide increases the risk of bladder squamous cell carcinoma.[13]

There have been several case reports on the coexistence of bladder stone and bladder squamous cell carcinoma. Fernando et al reported a case of large bladder stone with dimension of 5.5×5.6 cm with concurrent advanced stage bladder squamous cell carcinoma.[13] Pramod et al also reported a case of vesicolithiasis with concurrent urothelial carcinoma. Due to both diseases' entity are mostly asymptomatic, bladder cancer associated with vesicolithiasis is usually found at a later stage.[14] Furthermore, a meta-analysis by Yu et al showed that regardless of bladder cancer type, history of bladder stone increased risk of bladder cancer by twofold.[15]

Inflammation could increase risk of bladder cancer due to disturbances in antioxidant enzyme. Research have shown that chronic inflammation increases risk of carcinogenesis. Chronic inflammation causes recruitment of macrophage and lymphocytes, which in turns increase production of peroxynitrite in the bladder. Peroxynitrite is a mutagenic substance which could react with DNA and could cause mutation in bladder cancer.[12]

We believe that this case is interesting as we found a migrating IUD which acts as a growing point for bladder calculi, subsequently increasing risk of bladder cancer in our patient. To our knowledge, there has been limited report on these cases.

CONCLUSION

Migration of intrauterine device is a rare, but potentially dangerous side effect of IUD insertion. In the case of intravesical migration of IUD, the device could potentially become a nidus for stone growth, which resulted in vesicolithiasis. Furthermore, chronic vesicolithiasis could also increase risk of bladder cancer. Therefore, in patients with IUD we recommend routine evaluation of IUD placement, and in the case of

intravesical migration associated with vesicolithiasis and bladder tumor, lithotripsy followed by TURBT could be conducted with good efficacy and safety.

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