CASE REPORT

Vesico-utero-sigmoid Fistula Secondary to a Migrated Intra-uterine Contraceptive Device to the Urinary Bladder: A Rare Urogenital Complication

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Vesico-utero-sigmoid fistula secondary to an encrusted, transmigrated intrauterine contraceptive device (IUCD) to the urinary bladder is a rare urogenital occurrence. Reported here is a case of a 42-year-old female with 13 years of IUCD presenting with a two-year history of terminal dysuria, occasional hematuria and urinary dribbling. In the interim, she complained of persistent wet stools, pneumaturia, fecaluria and occasional urinary incontinence. Imaging revealed an encrusted IUCD with a concomitant vesico-utero-sigmoid fistula. Patient underwent a single setting colonoscopy, vagino-hysteroscopy, cystoscopy with cystostomy and extraction of encrusted foreign body (IUCD), excision and primary repair of vesico-utero-sigmoid fistula was done. The surgery proved successful, greatly improving the patient's quality of life. This is the first reported case of a vesico-utero-sigmoid fistula caused by a foreign body both in local and international literature.

Key words: Migrated intra-uterine contraceptive device (IUCD), vesico-uretero-sigmoid fistula, encrusted intrauterine device.

Introduction

Intrauterine contraceptive device (IUCD) is commonly used worldwide because of its reversible effects on female contraception.[1] Its safety, convenience, and low cost make it an appealing contraceptive option, especially in developing nations. Rare complications such as uterine embedment (IUCD located in the myometrium) and perforation (IUCD located beyond the uterine serosa) occur in approximately 1 in 1000 insertions.[2,3] Reported here is the first documented case of vesico-utero-sigmoid fistula secondary to an encrusted, migrated IUCD to the urinary bladder. This paper aimed to exhibit one of rarest complications of IUCD use, and the value of close follow-up after IUCD insertion. The authors would also like to emphasize the value of the different diagnostic modalities in the proper planning and management of vesico-utero-sigmoid fistulas.

The Case

The patient is a 42-year-old female, an overseas Filipino worker in Saudi Arabia, who came in the emergency room because of two-year history of terminal dysuria with occasional hematuria and urinary dribbling. Several consults were done in Saudi Arabia with a diagnosis of urinary tract infection. Kidney, ureter and urinary bladder (KUB) ultrasound revealed a migrated IUCD to the bladder. Patient was advised for surgical removal of the migrated IUCD, however, she opted to return to the Philippines for further intervention and was lost to follow up. One year prior to admission, persistence of symptoms, now with wet stools,

occasional pneumaturia, fecaluria and intermittent urinary incontinence prompted consult and referral to a urologist but with no compliance.

One month prior to admission, persistence of symptoms now with undocumented fever, dysuria and intermittency prompted urologic consult. KUB ultrasound and cystogram revealed an encrusted IUCD with leakage of contrast into the colon. The patient was advised admission but opted to transfer to this institution. Patient claimed that the IUCD had not been replaced or removed for 13 years.

On admission, genital, rectal and vaginal speculum exam were normal. Double-dye test was negative for fistulas. Urine GS/CS revealed growth of *E. coli* and was treated with Cefoxitin 1 g every 8 hours based on culture study. On pelvic X-ray, there was a T-shaped radio-opaque structure measuring approximately 3.7 cm in length with a round calcific density measuring 3.6 cm x 3.0 cm (Figure 1). The cystogram revealed adequate bladder distention and opacification of the urinary bladder lumen with extension into the colon (Figure 2). A contrast-enhanced abdominopelvic computed tomography (CT) scan confirmed a T-shaped radiopaque object with calcific densities (Hounsfield unit: 940-1050) measuring 3.1 cm x 2.6 cm inside the urinary bladder lumen. The delayed studies showed a fistulous tract in the postero-inferior aspect of the urinary bladder opacifying towards the sigmoid colon lumen (Figure 3). Given these following findings, a single setting colonoscopy, vagino-hysteroscopy, cystoscopy and open surgery was advised.

Colonoscopy was performed with urinary bladder irrigation of diluted methylene blue dye and fistulous tract was noted at the sigmoid colon, approximately 30 cm from the anal verge. An attempted cannulation of the fistulous tract was done; however, the tube can only be advanced approximately 0.5 cm (Figure 4). A vagino-hysteroscopy revealed an endometrial polyp at the posterior isthmus and a subsequent polypectomy was done. Multiple suspicious fistulous tracts at the anterior isthmus were noted, most probably from the previous area of IUCD migration. There was no egress of dye noted from the bladder (Figure 5). On cystoscopy, the urologists visualized an encrusted IUCD with approximately 1 cm solitary fistula located at the posterior wall of the urinary bladder (Figure 6).

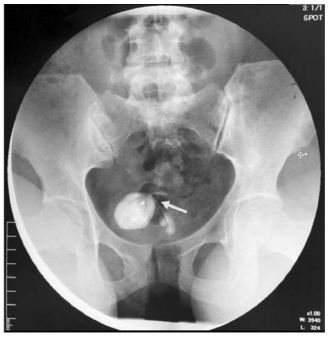

Figure 1. Pelvic X-ray AP view: a T-shaped radio-opaque (arrow) structure with a round calcific density.

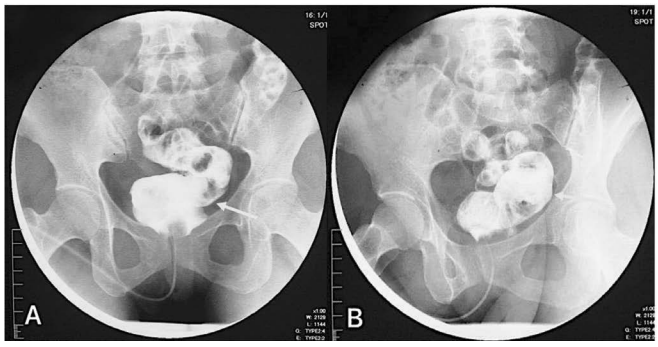

Figure 2. A – Cystogram AP view: opacification of the urinary bladder lumen with extension into the colon lumen (arrow); B – Cystogram Oblique view: opacification of the urinary bladder lumen with extension into the colon (arrow).

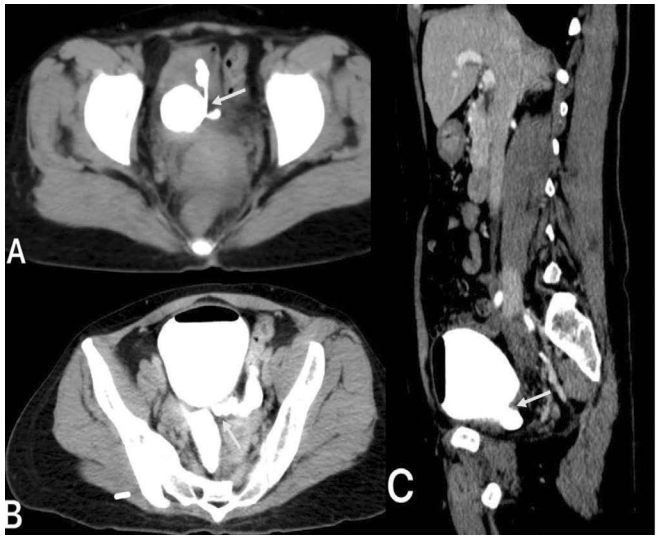

Figure 3. Abdominopelvic CT scan: A – Axial view: plain study showing a T-shaped radiopaque object with calcific densities (houndsfield unit: 940-1050) measuring 3.1 cm x 2.6 cm inside the urinary bladder lumen; B – Axial view; C – Sagittal view: both delayed studies showing a fistulous tract in the postero-inferior aspect of the bladder (arrow) opacifying to the sigmoid colon lumen.

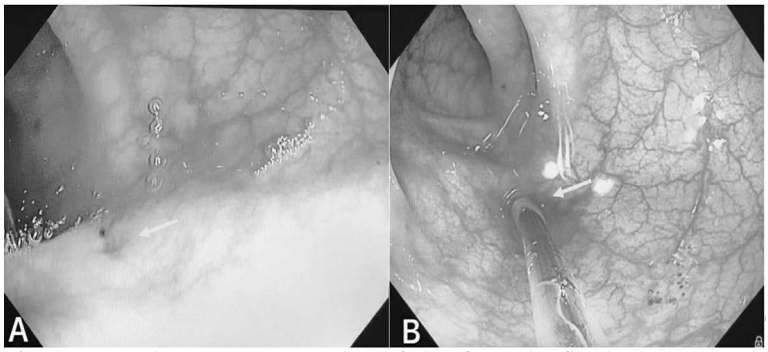

Figure 4. Colonoscopy: A –egress of dye from the fistula (arrow); B – attempted cannulation of the fistulous tract (arrow).

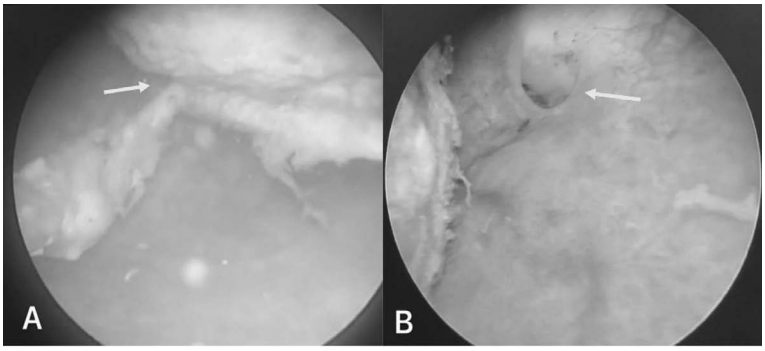

Figure 6. Cystoscopy: A – encrusted foreign body (arrow); B – fistula at the posterior bladder wall (arrow).

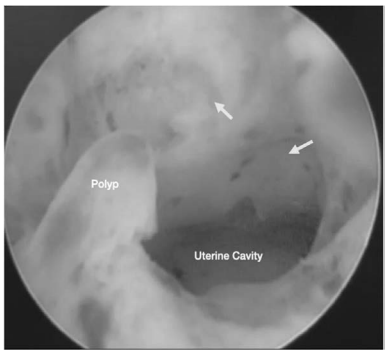

Figure 5. Vagino-hysteroscopy: endometrial polyp at the posterior isthmus with multiple suspicious fistulous tract at the anterior uterine wall (arrow).

Bladder exploration was performed through a vertical infra-umbilical approach showing the posterior area adherent to the sigmoid colon and the uterus where the fistula was located. A vertical incision was made approximately 1 cm below the fistula, anteriorly over the detrusor muscle up to the bladder mucosa exposing the encrusted, migrated IUCD (Figure 7). The migrated IUCD, containing approximately 4 cm oval-shaped encrustations, was extracted. A suspicious lesion was noted at the posterior bladder wall after the extraction of the encrusted IUCD (Figure 8) hence, sample tissues were taken for biopsy. The fistula was then cannulated with Fr 5 tube, noting a branched fistulous tract. One branch of the tract entered the sigmoid colon and the other branch entered the uterus. The fistula was then carefully excised separating the urinary bladder wall, sigmoid colon and anterior uterine wall (Figure 9). Debridement of the sigmoid colon and a double layer primary repair using continuous interlocking with Vicryl 3-0 suture for the first layer and interrupted with Silk 3-0 suture for the second layer was done. Debridement of the uterus and primary closure using continuous interlocking with Monocryl 0 suture was also performed. Finally, a Fr 18 foley catheter was inserted and the bladder defect was closed in a watertight, 2-layer repair using running Vicryl 3-0 suture for the mucosa and running Vicryl 2-0 suture for the muscularis. Bladder filling with 250 cc sterile water through the catheter was done with no note of leak.[6] An interpositional flap using the greater omentum was placed in between the posterior bladder and the uterus (Figure 10).

The post-operative course was uneventful and the patient was sent home on the fifth post-operative day with an indwelling foley catheter. Two weeks post-operatively, the repeat cystogram revealed an adequate bladder volume with no note of any leaks (Figure 11). The indwelling foley catheter was removed and the patient was able to void freely thereafter. After two months post-surgery, the patient was doing well, with no recurrence of symptoms. The histopathology report confirmed the diagnosis of a chronically inflamed fistula and the bladder likewise showed acute and chronic inflammation. The suspicious growth seen during hysteroscopy showed a benign endometrial

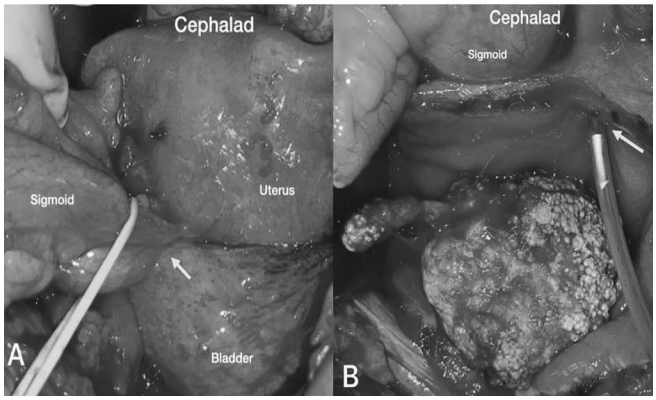

Figure 7. A – vesicosigmoid and vesicouterine fistula (arrow); B – bivalved urinary bladder with the encrusted foreign body (IUCD) inside; cannulated fistula at the posterior bladder wall (arrow).

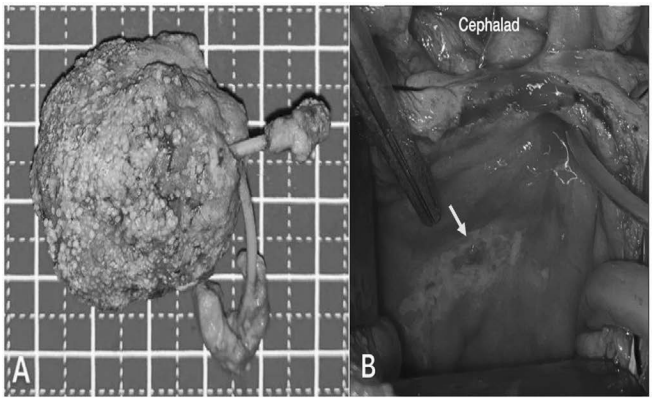

Figure 8. A – 4 x 3.5 cm encrusted foreign body (IUCD); B - bivalved bladder with suspicious lesion (arrow) noted at the posterior bladder wall after extraction of encrusted foreign body (IUCD).

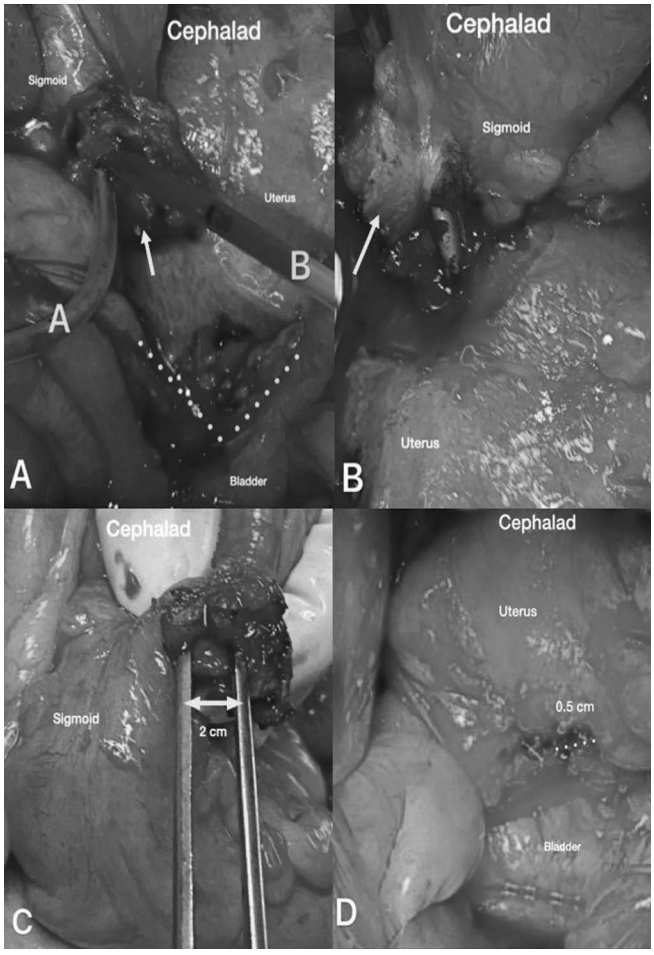

Figure 9. A – excised fistula (arrow) from the posterior bladder (dotted line) cannulated with 2 Fr5 tube showing the branched fistulous tract, one going to the sigmoid colon (A) and other going to the uterus (B); B – Vesicouterine fistula: excised fistula (arrow) from the bladder cannulated to the uterus; C – Vesicosigmoid Fistula: 2 cm in diameter (arrow), approximately 30 cm from the anal verge; D - Vesicouterine fistula: 0.5 cm in diameter (dotted line), anterior uterine wall.

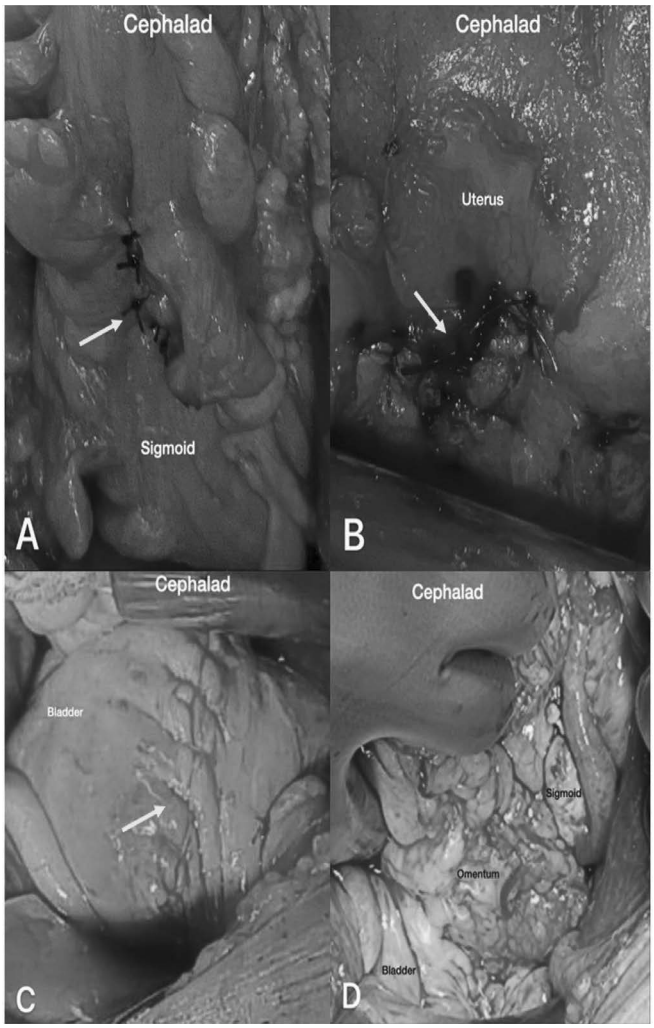

Figure 10. Debrided with primary repair vesicosigmoid fistula (arrow); B - Debrided with primary repair vesicouterine fistula (arrow); C – Cystorrhaphy (arrow); D – Interpositional flap (omentum) placed at the posterior bladder wall.

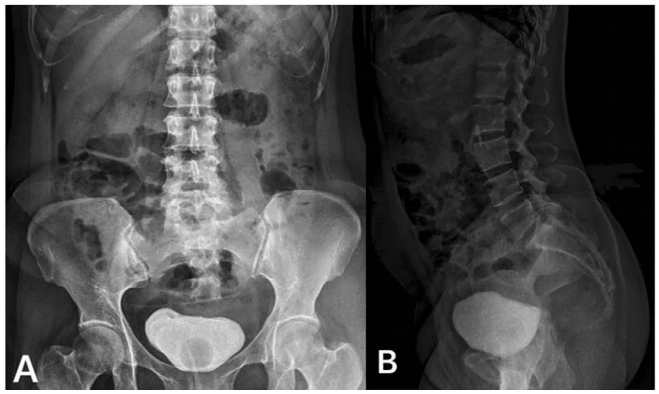

Figure 11. Cystogram: A – AP view: showing with adequate bladder volume without extravasation of contrast; B – Lateral view: no posterior extravasation of contrast.

polyp. The stone analysis of the encrustations revealed the composition of 58% carbonate apatite phosphate (dahllite), 30% calcium hydrogen phosphate dihydrate (brushite) and 12% magnesium ammonium phosphate (struvite).

Discussion

One of the rare complications of IUCD is migration. While cases are not large enough to warrant a statistical comparison, there is an increased risk if inserted immediately post-partum. Other risk factors for migration are use in nullipara, postabortion insertion, faulty technique of insertion, and irregular follow-up, as what happened in this case.[7,8] According to Joual et al, IUCD migration can be classified into incomplete or complete. Incomplete IUCD migration is seen when the device remains attached to the myometrium. Complete IUCD migration on the other hand is when the device drifts/travels to any site in the abdomen.[9] Incorrect direction to the uterine cavity, overestimation in the length of the uterine cavity, fragility of uterine wall due to recent birth, abortion, and pregnancy are contributory to the higher incidence of uterine perforation during IUCD insertion. After perforation of the uterine wall, IUCD can transmigrate to other adjacent organs such as the colon, wall of iliac vein, bladder, appendix, omentum, perirectal fat, retroperitoneal space, pouch of Douglas, ovaries, abdominal wall.[10,11] The authors deduce that iatrogeninc uterine perforation during IUCD insertion as the most plausible inciting factor in this case. Over the years, the intra-abdominal portion of the IUCD, particularly the arms, eroded and subsequently perforated the colon and the urinary bladder. With 13 years of neglect, proper placement of the IUCD was never assessed. Over time the intravesical portion of the IUCD, being exposed to urine, became a nidus for stone formation and growth. Slowly the encrustations grew leading to voiding symptoms. As time passed by the IUCD itself served as a plug hence patient remained asymptomatic. Bladder contractions must have slowly dislodged the IUCD towards the urinary bladder. Inflammation and fibrosis set in over the IUCD and sites of perforation, forming the fistulous tract. Once the IUCD has migrated, there has already a communication to the colon and uterus leading to the new onset of symptoms.

Acquired urinary tract fistulas are almost universally unexpected and may result in a great deal of inconvenience, discomfort, and physical disability to the affected individual. They are most often acquired because of a medical condition or surgical intervention for an unrelated problem. Vesicouterine fistula is a rare condition that only occurs in 1 to 4% of genitourinary fistulas. Gynecologic procedures such as low segment cesarean section are by far, the most common cause. It may or may not manifest with constant urinary incontinence because of the sphincter-like effect of the cervix.[12] Vesicouterine fistulas can be managed conservatively or through open surgery. Laparoscopic approach is feasible if done by an experienced surgeon.[13] Conservative management include prolonged indwelling bladder catheterization, fulguration of the fistula tract followed by hormonal induction of menopause have been used especially for small, immature fistulas. If these fail, the O'Conor transabdominal repair of vesicouterine fistula is the next option. The fistulous tract is excised from both structures, debridement of the uterus and bladder, and are closed individually with an interpositional flap, usually omentum, in between the two organs.[12] Vesicouterine fistulas that arise from a foreign body such as IUCD is also very rare. A case report by Szabó et al in 1992 described a 30-year-old female with urinary incontinence. The cystoscopic findings revealed an incompletely migrated, non-encrusted IUCD

perforated in the posterior bladder wall creating a vesicouterine fistula. The IUCD was removed cystoscopically through a grasper and initially managed conservatively with indwelling catheter for 6 weeks. Still with persistence of symptoms, they then did a transabdominal surgical approach. The surgery was successful, and the patient was discharged with improved symptoms.[14]

Uroenteric fistulas in general are most caused by diverticular disease (20%), Crohn disease (2-6%), and malignancy. Less common causes include radiation, infection, and trauma (external penetrating trauma, iatrogenic surgical trauma). Colovesical fistulas are commonly caused by diverticular disease in 75% of cases, with colon cancer, bladder cancer, radiotherapy, and Crohn's disease accounting for the remainder.[12] The standard approach for a colovesical fistula is an open surgery. Laparoscopic and robotic surgery is feasible and safe if done by an experienced surgeon. Non-surgical treatment is reserved to selected patients who are unfit for surgery. One-stage open surgical approach should be preferred, reserving the multi-stage procedure in patients with pelvic abscess, advanced malignancy or with previous radiation therapy.[15]

A combined colonic-gynecologic-urologic fistula is a much rarer condition. There is only one documented report presented as a case of a 74-year-old female with colo-vesico-vaginal fistula, however this was secondary to a sigmoid colon diverticulitis.[16] To date, there has been no reported case of a combined colonic-gynecologic-urologic fistulae that emerged from a foreign body specifically IUCD. The management of this case was based on the few case reports presented and following the basic principles of surgery for urinary tract fistulas.

In general, the principles of surgical management for urinary tract fistulas include: (a) adequate exposure of the fistulous tract with debridement of devitalized or necrotic tissue, (b) removal of involved foreign bodies or synthetic materials from region of fistula, (c) careful dissection and anatomic separation of the involved organ cavities, (d) watertight closure, (e) the use of well-vascularized and healthy tissue flaps for repair, (f) tension-free repair, (g) adequate urinary tract drainage after repair, and (h) prevention or treatment of infection.[12] Due to the complexity and rarity of what is causing the fistula, the authors decided that an open surgical procedure would be the best approach. In this approach, the urinary bladder, uterus, and sigmoid colon were clearly delineated. Through the cystostomy, the IUCD with a 4 cm encrustation was extracted. Meticulous inspection and debridement were done of the three involved organs and a watertight, tension free repair was ensured. Adequate urinary tract drainage after the repair was established through indwelling Foley catheter.

Conclusion

This case highlighted a very rare complication of a transmigrated IUCD. To the authors knowledge, this is the first documented case of vesico-utero-sigmoid fistula secondary to an encrusted, migrated IUCD to the urinary bladder. After IUCD insertion, regular follow up and examination are important to ensure its proper positioning and prevent IUCD transmigration to adjacent organs. Imaging modalities, combined with the help of video-assisted evaluations, and following the principles of surgical management of fistula would lead to a successful long-term outcome. Lastly, this case foregrounded that even in the advent of endo-laparoscopic and robotic urologic surgery, open surgery still proves to be an integral part of the urologist's armamentarium.

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