Research and Reports in Urology

Dovepress
Taylor & Francis Group

Open Access Full Text Article

CASE REPORT

Cable Wire as a Nidus for Vesicolithiasis: A Case Report

Johannes Cansius Prihadi[1,2], Antoninus Hengky[1], Leonardo Ongga[3]

[1]Division of Urology, Department of Surgery, School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Jakarta, Indonesia; [2]Division of Urology, Department of Surgery, Atma Jaya Hospital, Jakarta, Indonesia; [3]School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Jakarta, Indonesia

Correspondence: Johannes Cansius Prihadi, Email johannes.cansius@atmajaya.ac.id

Abstract: Bladder foreign bodies (BFBs) are an uncommon clinical occurrence, often resulting from trauma, self-insertion, iatrogenic causes, or organ migration. These objects can act as nidus for stone formation, leading to vesicolithiasis. Here, we present a rare case of a 61-year-old male with hematuria, dysuria, and abdominal pain. Initial evaluation, including imaging and cystoscopy, revealed a bladder stone encapsulating a foreign object identified as a blue cable wire. Despite denying self-insertion, his history suggested potential unreported trauma. Management involved cystoscopic lithotripsy and foreign body extraction. The case underscores how foreign objects act as nidus for stone formation through inflammatory and biochemical pathways, emphasizing the importance of early diagnosis and appropriate surgical management to prevent severe complications.

Keywords: bladder foreign body, vesicolithiasis, stone formation, hematuria, cystoscopy, case report

Introduction

Bladder foreign bodies (BFBs) are uncommon clinical manifestations that frequently arise from trauma, self-insertion, iatrogenic causes, or migration from nearby organs. Rarely, these foreign objects may serve as nidus for the production of stones, resulting in vesicolithiasis. Vesicolithiasis, or bladder stone formation, is a relatively uncommon condition, but it can become clinically significant when associated with intravesical foreign bodies. The presence of foreign objects within the bladder creates a nidus for stone formation by inducing local inflammation, urinary stasis, and crystallization of urinary salts. A recent case reported by Chakit et al highlighted that large bladder stones, including those caused by foreign bodies, often require surgical intervention such as cystolithotomy for complete resolution and symptom relief.[1] Recurrent urinary tract infections, hematuria, and dysuria are possible presenting signs. Serious morbidity may arise from a delayed or incorrect diagnosis. We report a rare case of the bladder foreign body was identified as a cable wire, which is particularly unusual and emphasizes the diverse etiologies of vesicolithiasis. Furthermore, the patient's denial of self-insertion highlights the diagnostic challenge, as such cases often involve patient hesitation or embarrassment, leading to delayed diagnosis and management.

Case Presentation

Patient History

A 61-year-old man, arrived at our urology outpatient department complaining of hematuria, lower abdominal pain that radiated to both flanks and occasional dysuria that had persisted for a month. The pain initially occurred intermittently but became persistent in the last two weeks. The patient described periodic chills and malaise during the previous month. The bowel habits were typical. Other LUTS (lower urinary tract symptoms), such as urinary frequency, retention, nocturia were denied. Other symptoms including nausea and vomiting were also denied. Patient denied having had inserted foreign bodies into the urethra. He denied any substantial family or prior medical history other than three-month-old diagnosis of hypertension. He claimed to have no known allergies and to smoke two cigarettes a day. The patient and his family, however, denied having a history of serious urological disorders, benign prostatic hyperplasia (BPH), or sexually transmitted disease (STD).

Received: 5 February 2025
Accepted: 24 April 2025
Published: 8 May 2025

The patient stated that he has no prior history of surgery. The patient recounted his first experience of lower abdomen pain and dysuria a year earlier, when he manually removed a substance that resembled blue thread from his urethra.

Investigation

The patient was hemodynamically stable upon admission. The blood pressure was 133/86 mmHg with heart rate of 64 bpm. Patient breath on room air with 97% oxygen saturation and respiratory rate of 18 breaths/min. The temperature was normal (36.5C).

A physical examination showed no unusual findings, including no palpable masses in the abdomen, organomegaly, or tenderness. There were no visible foreign objects, and the genital inspection was normal. The laboratory results revealed slight anemia (Hb: 12.7 g/dL) and microcytosis (MCV: 66.4 fL), but renal and liver function tests were normal. The urinalysis showed hematuria and leukocyturia. Plain abdominal radiographs showed a radiopaque foreign mass inside the bladder that was linked to stone formation with enhanced opacity within the stone (size 3.82×4.36 cm) resemble a chain or wire (Figure 1).

Management

The patient underwent cystoscopy, which confirmed the presence of a large bladder stone encapsulating foreign material. Lithotripsy was performed using mechanical lithotriptor to fragment and remove the stone, and a foreign thread-like material was extracted inside. From cystoscopic view, the foreign body is blue cable wire (Figure 2). Postoperative recovery was uneventful, and the patient was discharged on the 3rd day with antibiotics and analgesics. At the first follow-up visit after one month, the patient remained asymptomatic. This status persisted at the next follow-up a month later.

Discussion

Vesicolithiasis, or bladder stone formation, can occur due to various etiological factors, including the presence of foreign bodies within the bladder. This case report discusses a 61-year-old male patient with hematuria and abdominal pain, leading to the discovery of a large bladder stone encapsulating a foreign body.

Mechanism of Stone Formation in the Presence of Bladder Foreign Bodies

Bladder stone formation in the presence of foreign bodies is a multifactorial process that involves both mechanical and biochemical pathways. Foreign bodies act as a nidus for stone formation by disrupting the normal urothelial environment. When a foreign object is introduced into the bladder, it triggers a local inflammatory response.[2,3] This leads to epithelial injury, increased mucous secretion, and the deposition of urinary salts, such as calcium oxalate, calcium phosphate, uric

Figure 1 Plain radiograph of the patient with the size of 3.82×4.36 cm.

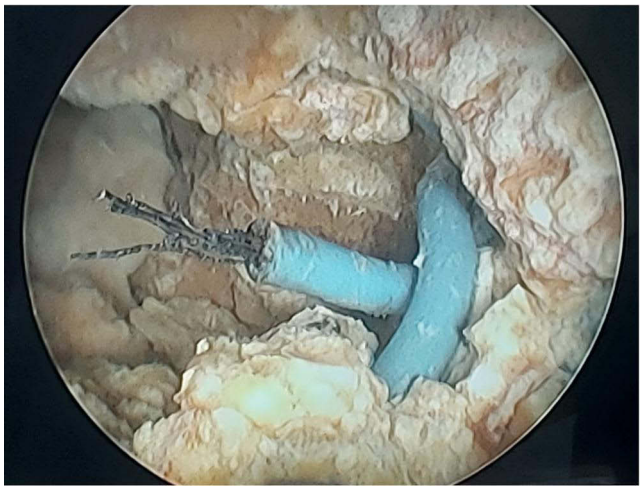

Figure 2 Cystoscopic view of the foreign body after stone fragmentation.

acid, and struvite, on the foreign body's surface. Over time, the accretion of these materials results in stone formation. Additionally, the presence of a foreign body may alter urinary flow, promoting urinary stasis, a key factor in the crystallization process.[4,5] Foreign bodies often serve as a nidus for bacterial colonization, resulting in urinary tract infections (UTIs). The inflammation and changes in urinary pH associated with infections can further facilitate stone formation.[5,6] The interaction between the foreign body and urine constituents can lead to changes in chemical composition that favor stone formation. For instance, the presence of certain metals or materials may alter the solubility of minerals in urine, contributing to lithogenesis.[7–9]

In this case, the foreign body, identified as a blue cable wire, served as a nucleus for bladder stone formation. The irregular surface of the wire likely facilitated mineral deposition. Chronic irritation from the foreign body and subsequent stone development may have exacerbated the patient's symptoms of hematuria, dysuria, and abdominal pain.

Etiology

The etiology of bladder foreign bodies is diverse and includes self-insertion, iatrogenic causes, migration from adjacent organs, or traumatic introduction. While the patient in this case denied intentionally inserting a foreign body, his history of urethral bleeding following casual sexual activity suggests a potential overlooked or unreported event. Foreign bodies like wires, threads, or other materials can remain unnoticed until they elicit significant symptoms,[10] as seen here. Patients may insert objects for sexual gratification or due to psychiatric conditions.[11] Surprisingly, major injuries are rare when foreign bodies are put into the urethra, even though some of these objects are large, sharp, or pointed. This might be due to tubular constructions, mucosal lubrication, and the ability of bladder to expand. Furthermore, people may purposefully learn to widen these apertures in order to fit bigger items. The prior surgical history might also be relevant, as surgical materials can occasionally be retained inadvertently.[7,10] Foreign bodies from nearby anatomical structures can migrate into the bladder.

Chemical Composition

Bladder stones often comprise a mixture of minerals influenced by urinary pH and the presence of infection. In cases involving foreign bodies, struvite stones, composed of magnesium ammonium phosphate, are common due to the high likelihood of urinary tract infections (UTIs).[6,12–14] Bacteria such as Proteus, Klebsiella, and Pseudomonas species are urease-producing, raising urinary pH and facilitating the precipitation of struvite crystals. Chemical analysis of the stone could provide insights into its composition and the role of infection in its development, which should be considered in guiding treatment and prevention strategies.[15]

Diagnosis

The diagnosis of vesicolithiasis due to foreign bodies relies on a combination of clinical suspicion, imaging, and endoscopic evaluation. Symptoms such as hematuria, dysuria, and lower abdominal pain are indicative. The patient's history is crucial; embarrassment may lead patients to delay seeking medical help.[8,16] In this case, plain abdominal radiographs revealed a radiopaque mass with enhanced opacity resembling a chain or wire, indicative of a foreign body encapsulated within a bladder stone. The object will typically be situated mediolaterally if it is in the bladder.[17] It will typically be positioned craniocaudally if it is in the rectum or vagina. The precise position of a foreign body can be ascertained with the use of endoscopy, contrast material tests, and oblique and lateral pelvic radiography.[17] Cystoscopy remains the gold standard for confirming the presence of bladder foreign bodies and associated stones, as it allows direct visualization and aids in treatment planning, even retrieval of foreign bodies and stones within the bladder.[18] Laboratory tests may reveal secondary complications such as anemia or infection, as noted with the mild anemia in this patient. Ultrasound and CT scans can also provide detailed information about stone size and possible composition.[16]

Management

The management of bladder stones associated with foreign bodies requires the removal of the stone and extraction of the foreign material. There are two main approaches for this, either by endoscopic removal or open surgery. In this case, lithotripsy was successfully employed to fragment and remove the stone, while the foreign body was extracted using cystoscopy.[7,19] This method ensures minimal invasiveness and allows for direct inspection of the bladder to rule out additional pathology. In cases where stones are large or complicated by other factors (eg, extensive tissue damage), open surgical procedures may be necessary.[16,20,21] Postoperative care, including antibiotic therapy, is critical to prevent infection and ensure uneventful recovery.

Complications

Complications of bladder foreign bodies and associated stones can be significant if left untreated. Chronic inflammation and irritation may lead to hematuria, recurrent UTIs, bladder wall erosion, or fistula formation.[22] Erosions might lead to fistula formation between the bladder and adjacent organs (eg, vagina or intestine).[5] In rare cases, untreated stones can contribute to bladder outlet obstruction, renal dysfunction, or malignancy due to persistent epithelial damage and chronic irritation might lead to formation of cancer.[23–25]

In this patient, timely diagnosis and intervention likely prevented more severe complications, highlighting the importance of prompt evaluation in symptomatic individuals. Currently there is no general guideline specifically for bladder foreign bodies, but patient at risk of re-insertion might need psychiatric evaluation.[26,27] Given the potential for recurrent stone formation or complications related to foreign body remnants and risk for re-insertion, long-term follow-up is recommended. The patient should undergo routine clinical evaluation at 3 months, 6 months, and annually to monitor for symptoms of recurrence or complications. Imaging studies such as USG or plain radiograph may be needed to assess for any residual material or new stone formation. Prompt intervention if signs of recurrent hematuria, dysuria, or stone formation are noted.

Conclusion

Bladder stone with foreign bodies is a rare case that might go unnoticed. Bladder foreign bodies elicit the stone formation by providing nidus and introducing pathogens causing infections in longer fashion. Once symptoms occur, the diagnosis is usually straightforward. Management depends on the nature of the foreign bodies, stone, and patient factor.

Informed Consent

Institutional approval was not required for this case report, as it involved a single patient and did not constitute a study requiring ethical board review according to our institution's guidelines. However, we have obtained written informed consent from the patient for publication of the case details and any accompanying images.

Disclosure

The authors report no conflicts of interest in this work.

References

1. Chakit M, Aqira A, Mesfioui A. A case report of a giant bladder stone (12 x 8 cm, 610). *Radiol Case Rep*. 2024;19(3):970–973. doi:10.1016/j.radcr.2023.11.081
2. Kosan M, Gonulalan U, Ozturk B, et al. Tissue reactions of suture materials (polyglactine 910, chromed catgut and polydioxanone) on rat bladder wall and their role in bladder stone formation. *Urol Res*. 2008;36:43–49. doi:10.1007/s00240-007-0124-2
3. Murat Samli M, Demirbas M, Guler C, Aktepe F, Dincel C. Early tissue reactions in the rat bladder wall after contact with three different synthetic mesh materials. *BJU Int*. 2004;93(4):617–621. doi:10.1111/j.1464-410X.2003.04676.x
4. Dalton DL, Hughes J, Glenn JF. Foreign bodies and urinary stones. *Urology*. 1975;6(1):1–5. doi:10.1016/0090-4295(75)90582-8
5. Kachkoul R, Touimi GB, El-Mouhri G, El-Habbani R, Lahrichi A. Pathophysiological aspects of renal stone formation and stone types. *Notulae Scientia Biologicae*. 2023;15(1):11462. doi:10.55779/nsb15111462
6. Strohmaier WL. Infection induced urinary stones. Version: 2018-02-27. In: Bjerklund Johansen TE, Wagenlehner FME, Matsumoto T, et al., editors. *Urogenital Infections and Inflammations*. Duesseldorf: German Medical Science GMS Publishing House; 2017. doi:10.5680/lhuii000017
7. Kamal F, Clark ATD, Lavallée LT, Roberts M, Watterson J. Intravesical foreign body–induced bladder calculi resulting in obstructive renal failure. *Can Urol Assoc J*. 2008;2(5):546–548. doi:10.5489/cuaj.927
8. Chaabouni A, Samet A, Fourati M, Harbi H, Amine Mseddi M, Hadjslimene M. A bladder stone surrounding a foreign body: a rare case. *Urol Case Rep*. 2021;40:101943. doi:10.1016/j.eucr.2021.101943
9. Papatsoris AG, Varkarakis I, Dellis A, Deliveliotis C. Bladder lithiasis: from open surgery to lithotripsy. *Urol Res*. 2006;34(3):163–167. doi:10.1007/s00240-006-0045-5
10. Dursun M, Danis E, Otunctemur A, Ozbek E. Foreign body stone of the ureter originated from the suture thread: a case report. *Prague Med Rep*. 2014;115:141–144. doi:10.14712/23362936.2014.45
11. Moon SJ, Kim DH, Chung JH, et al. Unusual foreign bodies in the urinary bladder and urethra due to autoerotism. *Int Neurourol J*. 2010;14(3):186–189. doi:10.5213/inj.2010.14.3.186
12. Schultz LN, Connolly J, Lauchnor E, Hobbs TA, Gerlach R. Struvite stone formation by ureolytic biofilm infections. In: Lange D, Chew B, editors. *The Role of Bacteria in Urology*. Cham: Springer International Publishing; 2016:41–49. doi:10.1007/978-3-319-17732-8_5
13. Stroup SP, Auge BK. Urinary infection and struvite stones. In: Rao NP, Preminger GM, Kavanagh JP, editors. *Urinary Tract Stone Disease*. London: Springer; 2011:217–224. doi:10.1007/978-1-84800-362-0_18
14. Khan SR, Hackett RL. Urolithogenesis of mixed foreign body stones. *J Urol*. 1987;138(5):1321–1328. doi:10.1016/S0022-5347(17)43592-0
15. Stav K, Dwyer PL. Urinary bladder stones in women. *Obstet Gynecol Surv*. 2012;67(11):715–725. doi:10.1097/OGX.0b013e3182735720
16. Napitulu T, Susanto M, Duma G, Rahman EY. Giant bladder stone: a case report and literature review. *JMA J*. 2022;5(3):384–388.
17. Hunter TB, Taljanovic MS. Foreign bodies. *RadioGraphics*. 2003;23(3):731–757. doi:10.1148/rg.233025137
18. Skolarikos A, Jung H, Neisius A, et al. EAU Guidelines on Urolithiasis. European Association of Urology; 2025. Available from: https://uroweb.org/guidelines/urolithiasis. Accessed April 29, 2025.
19. Rahman NU, Elliott SP, McAninch JW. Self-inflicted male urethral foreign body insertion: endoscopic management and complications. *BJU Int*. 2004;94(7):1051–1053. doi:10.1111/j.1464-410X.2004.05103.x
20. Signh PS, Pandey A, Gupta V, Pandey J, Verma R. Presentation of an ingested foreign body as a vesical calculus: a common condition. *Ann Pediatr Surg*. 2017;13(1):50–51. doi:10.1097/01.XPS.0000489162.87949.60
21. Wijaya A, Telussa A. Serial cases report: 3 cases of giant bladder stone in Dilumil Public Health Center, East Nusa Tenggara, Indonesia. *Cendana Med J*. 2021;1:1.
22. Mahajan AD, Mahajan SA. Intravesical migration of the longest forgotten intrauterine contraceptive device with secondary vesicolithiasis in a 70-year-old female: a rare case report. *J Clin Diagn Res*. 2022;16(2):1–2.
23. Leslie SW, Sajjad H, Sharma S. Prevention of inappropriate self-extraction of foley catheters.. In: *StatPearls*. Treasure Island (FL): StatPearls Publishing; 2024.
24. Pramod SV, Safriadi F, Hernowo BS, Dwiyana RF, Ksatriapraja RA. A large bladder leiomyoma. *Urol Case Rep*. 2020;32:101211. doi:10.1016/j.eucr.2020.101211
25. Hu J, Phan AT, Craig D. A rare case of a giant bladder stone associated with post-obstructive renal failure managed by open cystolithotomy. *Cureus*. 2023;15(5):e39718. doi:10.7759/cureus.39718
26. Bansal A, Yadav P, Kumar M, et al. Foreign bodies in the urinary bladder and their management: a single-centre experience from North India. *Int Neurourol J*. 2016;20:260–269. doi:10.5213/inj.1632524.262
27. Ahmed MHS, Pawar PW, Sawant AS, et al. Foreign body in urinary bladder: our experience and review of literature. *Intl Surg J*. 2019;6:4327–4331. doi:10.18203/2349-2902.isj20195388