

MANAGEMENT CHALLENGES OF URETERAL FOREIGN BODY-CLINICAL VIGNETTE AND REVIEW OF LITERATURE

Ayun Cassell¹, Mohamed Jalloh¹, Mouhamadou M. Mbodji¹, Abdourahmane Diallo¹, Madina Ndoye¹, Yoro Diallo², Issa Labou¹, Lamine Niang¹, Serigne M. Gueye¹

¹Department of Urology and Andrology, Hopital General de Grand Yoff, Dakar, Senegal

²UFR Sante, Universite de Thies, Senegal

Corresponding Author: ayuncasselliii@gmail.com

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ABSTRACT

Foreign body in the ureter is not common. Most cases of eroded foreign body are preceded by an endoscopic or laparoscopic procedure. For most cases, ureteroscopy, holmium laser fragmentation of encrusted or calcified foreign body followed by extraction of foreign body using grasping forceps have provided optimal outcome. The literature review was conducted to assess the challenges in the management of ureteral foreign body in 13 case reports and compared the outcome using a clinical vignette of a 48-year-old female with metallic clip in the left proximal ureters following laparoscopic left hemicolectomy managed successfully with ureteroscopic holmium laser fragmentation and extraction with grasping forceps.

Keywords: *Grasping Forceps, Holmium Laser, Ureteroscopy*

Foreign bodies in the ureters are very rare¹ and the main problems with ureteral foreign bodies are infections and obstructions due to calcifications.¹⁻⁴ Migration or erosion of suture materials, mesh, Hem-o-Lok clips, metallic clips, vascular graft materials, coils used for embolization, guidewire introducer, suprapubic catheter, intrauterine contraceptive device into the ureters have been reported in the literature.¹⁻¹³ In some clinical scenarios, symptoms such as flank pain, urinary tract infections, and lower urinary tract symptoms (frequency, hematuria, and dysuria) may be an indication for a foreign body erosion into the urinary tract.^{3,4,9}

Foreign body in the ureters may also appear as calculus or may be themselves be calcified making imaging alone difficult for diagnosis.³ Therefore nephro-ureteroscopy is a useful adjunct for diagnosis and treatment.^{3,4,8,13} This allows lasers fragmentation of stone^{3,10,13} as well as extraction of foreign body using grasping forceps.^{9,10,13} Methods for

extraction of such foreign bodies may also depend on the anatomical location, size, shape, and mobility of the object.^{4,5,7,8,10} In cases of large foreign body, ureteral stenosis, nonfunctioning kidney requiring segmental ureterectomy + ureteroneocystostomy or nephroureterectomy; open or laparoscopic surgery may be feasible.^{5,6,9-11}

We reviewed the literature to assess the challenges in the management of ureteral foreign body and compared the outcome using a clinical vignette of a 48-year-old female with metallic clip in the left proximal ureters following laparoscopic left hemicolectomy managed successfully with ureteroscopic holmium laser fragmentation and extraction with grasping forceps.

METHODOLOGY

This is a review article of 14 case reports on rare causes of foreign body in the ureters from 2002 to 2019 as well as one clinical vignette from the Hopital General de Grand Yoff, Dakar Senegal as indicated

in the (Figures 1–4). The review was conducted using the following electronic databases PubMed, *African Journal Online*, Google and Google Scholar.

FIG. 1 Computed tomographic urography of a 48-year-old female presenting with left flank pain and hematuria at the (Hopital General De Grand Yoff, Dakar Senegal) showing a hyperdense structure lodged in the proximal ureters 2 years after a laparoscopic left hemicolectomy.

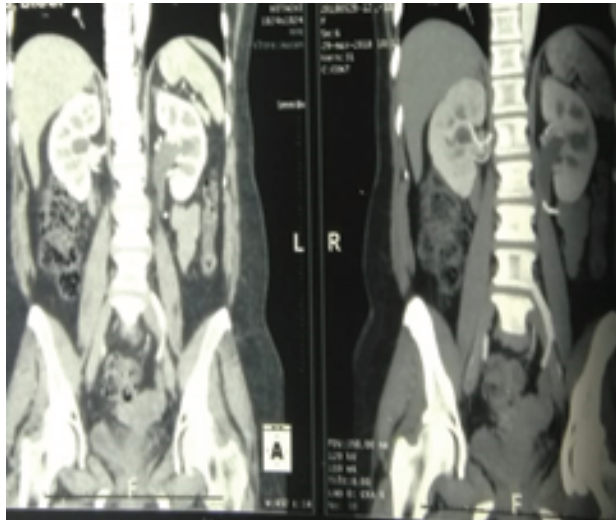
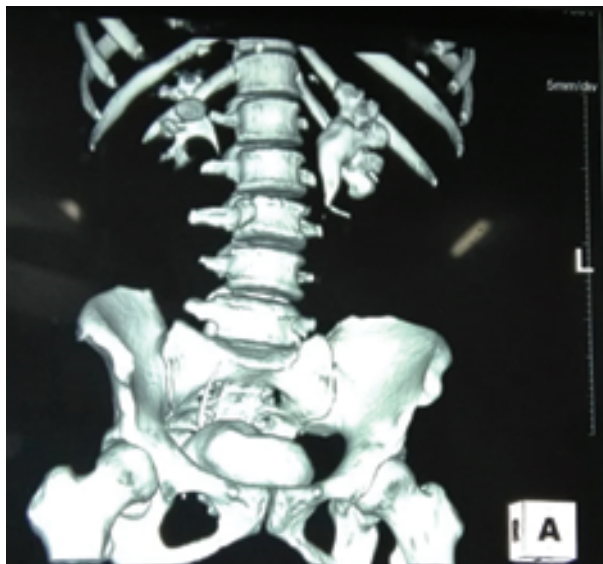


FIG. 2 3-D computed tomography reconstruction showing the foreign body (migrated metallic clip from previous laparoscopic surgery) that has eroded through the walls of the left proximal ureters.

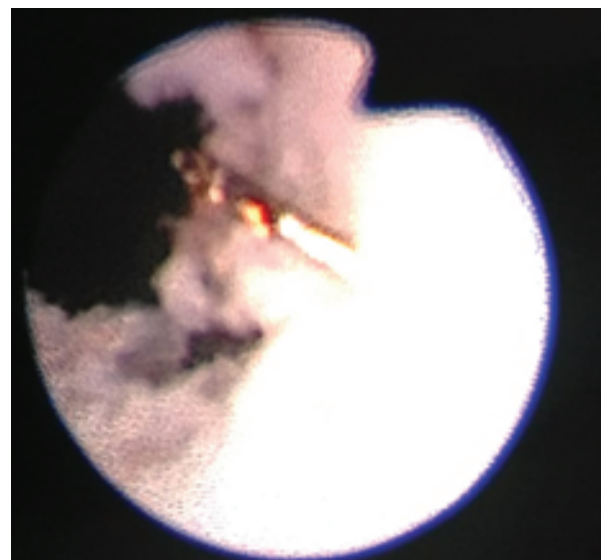


The search term used was (ureteral foreign body). Both the abstract and full text of these cases were retrieved, and the following parameters reviewed:

FIG. 3 Semi-rigid ureteroscopy showing the encrustation and calcification of the eroded metallic clip along the wall of the proximal ureters.



FIG. 4 Metallic clip exposed during Holmium Laser fragmentation and grasping forceps used for extraction. The postoperative outcome was satisfactory.



age, sex, type of foreign body, localization of the foreign body, indwelling time, clinical presentation, precipitating factor and management techniques for foreign body extraction. All case of fragmented or prolonged double J ureteral stents were exclude from the review considering they were complications of a

therapeutic intervention. The data was analyzed using both qualitatively and quantitatively. The quantitative data was analyzed using IBM SPSS data editor and the results were presented as ratio, range and means in the text of the results. The data was presented qualitatively as shown in (Table 1 and 2) below.

TABLE 1 Qualitative Data Below Displaying Rare Cases of Foreign Body along the Ureters Considering Variables As Age, Sex, Foreign Body Material, Localization and the Indwelling Time

Study	Age	Sex	Foreign Body	Localization	Indwelling Time
Sener et al. 2015 [1]	63 years	M	guidewire introducer	Right Proximal Ureter	70 days
Shrivastava P, et al. 2017 [2]	69 years	M	Hem-o-Lok clips	Left mid ureter	3 years
Kurz et al. 2016 [3]	38 years	M	metal surgical clip + suture material	Right Proximal ureter	18 years
Silva et al. 2019 [4]	55 years	F	embolization coils	Right Proximal ureters	6 months
Miraliakbari et al. 2011 [5]	78 years	F	transvaginal tape	Left distal ureter	4 years
Shuaibin et al. 2018 [6]	80 years	M	Suprapubic Catheter	Left distal ureter	12 days
Da Silva et al. 2015 [7]	82 years	M	Gortex pieces + prolene suture	All segments of rt. ureter	8 years
Dursun et al. 2014 [8]	56 years	F	Prolene Suture material	Left mid ureter	20 years
Chen et al. 2012 [9]	61 years	F	Endoscopic glue material	Right proximal ureters	3 weeks
Lawrentschuk et al 2004 [10]	60 years	F	Polyester suture material	Right distal ureters	6 weeks
Li et al. 2019 [11]	30 years	F	Intrauterine contraceptive device	Left distal ureters	3 years
Qublan et al. 2002 [12]	32 years	F	Intrauterine contraceptive device	Left distal ureters	58 days
Mamoulakis et al 2017 [13]	65 years	M	Suture material	Right proximal ureters	19 months
Figure 1–4	48 years	F	Metallic clip	Left proximal ureters	2 years

TABLE 2 The Clinical Presentation, Precipitating Factors and Management Were Also Highlighted

Study	Clinical Presentation	Cause/Precipitating Factors	Management
Sener et al. 2015 [1]	Incidental imaging findings	right-sided segmental ureterectomy for ureteral tumor + anastomosis	Right-sided segmental ureterectomy of the stenotic segment + ureteroneocystostomy and removal of the foreign object
Shrivastava P, et al. 2017 [2]	Frequency, dysuria, pyuria	laparoscopic partial nephrectomy for	Shrivastava P, et al. 2017
Kurz et al. 2016 [3]	intermittent right flank pain, hematuria	open right pyeloplasty for right UPJ obstruction	Ureteroscopy + Holmium laser fragmentation + basket for extraction
Silva et al. 2019 [4]	fever and right flank pain	percutaneous nephrolithotomy with renal embolization for bleeding	Holmium Laser Fibers and stone extractor
Miraliakbari et al. 2011 [5]	Left flank pain dysuria	transvaginal tape for stress incontinence	Ureteroscopy + Holmium laser fragmentation + distal ureterectomy and ureteroneocystostomy
Shuaibin et al. 2018 [6]	Hematuria and pyuria	Cystostomy for Neurogenic bladder	Ultrasound guided catheter removal
Da Silva et al. 2015 [7]	Incidental CT right-sided hydronephrosis	Aorto-biiliac grafting for bilateral iliac aneurysms	Ureteroscopy + grasping forceps for extraction
Dursun et al. 2014 [8]	left flank pain, dysuria, hematuria.	Laparotomy caused by stab wound injury	Ureterorenoscopy + Holmium laser+ grasping forceps
Chen et al. 2012 [9]	Dysuria, hematuria	Embolization of bleeding pseudoaneurysm of right renal artery	Failed Ureterorenoscopy + Spontaneous passage
Lawrentschuk et al 2004 [10]	Right flank pain	Sacrospinous culposuspension	Ureterorenoscopy + Holmium Laser
Li et al. 2019 [11]	Left flank pain	Intrauterine contraceptive device placement (IUCD)	Laparoscopic left nephroureterectomy
Qublan et al. 2002 [12]	Left iliac fossa pain, dysuria, hematuria	Intrauterine contraceptive device placement (IUCD)	Cystolithotomy + removal of IUCD
Mamoulakis et al 2017 [13]	Incidental MRI findings	Nephrostomy tube for hydronephrosis	Holmium Laser + grasping forceps
Figure 1–4	Left flank pain, hematuria	Laparoscopic left hemicolectomy	Holmium Laser + grasping forceps

RESULTS AND DISCUSSION

There were 13 case reports on ureteral foreign body as shown in (Table 1) and 1 clinical case highlight of metallic clip in the proximal ureters as shown in the (Figure 4) below. A total of 14 cases were reviewed with a male to female ratio of 0.75 to 1. The mean age of the patients was 58 years with Da Silva et al⁷ reporting the maximum age at 82 years. Four case reports revealed suture material as a foreign body in the ureters causing encrustation and calcification.^{3,8,10,13} Case reports by Qublan et al. and Mamoulakis et al. revealed intrauterine contraceptive device as a foreign body both in the distal ureters.^{3,12} Metallic clip was reported by 2 studies as a ureteral foreign including the highlighted case in figures below.^{2,3} Guidewire introducer in the right proximal ureter, suprapubic catheter in the left distal ureter, embolization coil and endoscopic glue material both in the proximal ureter were revealed in 4 case studies.^{1,4,6,9}

The proximal ureter was the commonest site for foreign body in the review 42% (6/14) as most of the precipitating factors or previous procedures were in the vicinity of the proximal ureter and kidney. The mean indwelling time of the foreign body in the ureters was 4.3 years as Shuaibin et al. reported the least duration of 12 days with a suprapubic catheter dislodged in the left distal ureters.⁶ The most common presenting symptom was hematuria as revealed in several reports^{3,6,8,9,12} as well as the clinical highlight displayed in Figure 1. Other symptoms reported were flank pain,^{3-5,10,11} followed by dysuria,^{2,5,8,12} along with two incidental findings from imaging.^{1,13}

A total of 10/14 of the case reports, (Figure 3 and 4)^{2,5-10,13} highlighted ureteroscopy ± holmium laser fragmentation of calcification along with grasping forceps for retraction of foreign body. Li et al. reported a laparoscopic left nephroureterectomy for a nonfunctioning kidney after lodging an intrauterine contraceptive device in the left distal ureter for 3 years.¹¹ Case reports by Sener et al.¹ and Miraliakbari et al.⁵ demonstrated segmental ureterectomy of the stenotic segment along with ureteroneocystostomy and removal of the foreign objects. Chen et al.⁹ showed a failed ureteroscopy followed by spontaneous passage of an endoscopic glue material.

CONCLUSION

Foreign body in the ureter is not common. Most cases of eroded foreign body are preceded by an open, endoscopic or laparoscopic procedure. For most cases, ureteroscopy, holmium laser fragmentation of encrusted or calcified foreign body followed by extraction of foreign body using grasping forceps have provided optimal outcome. Nevertheless, a few may require laparoscopic or open intervention.

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CONFLICT OF INTEREST

The authors declare no conflict of interest regarding this article.

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