UIJ UroToday International Journal®

www.urotodayinternationaljournal.com
Volume 2 - June 2009

Ureteroscopy With Two Guide Wires: A New Technique

Wael M. Gamal
Department of Urology, Sohag University, Sohag, Egypt
Submitted March 24, 2009 - Accepted for Publication April 16, 2009

ABSTRACT

INTRODUCTION: The purpose of the investigation was to evaluate the use of the two-wire technique for acute dilatation of the intramural ureter for ureteroscopy.

METHODS: Between April 2003 and April 2007, 400 consecutive ureteroscopic procedures were performed. There were 55 patients (40 male, 15 female) with a mean age of 28 years (range, 20-45 years). Patients had acute dilatation of the intramural ureter by the two-wire technique.

RESULTS: The mean operation time was 34 minutes (range, 20–70 minutes). All patients underwent successful ureteroscopy with a semirigid ureteroscope using the two-wire technique. Perforation or intramural false passage of the ureter did not occur. Patients were discharged from the hospital within 6–12 hours. The mean follow-up was 9.7 months (range, 6–18 months). Ultrasonography, intravenous urogram, and voiding cystourethrography were obtained at 3 and 6 months. Ultrasonography was done every 3 months until the end of the follow-up period. Follow-up imaging showed no distal-ureteral stricture or vesicoureteral reflux.

CONCLUSIONS: Acute dilatation of the intramural ureter by the two-wire technique is cost effective, easy, and time saving with no associated complications.

KEY WORDS: Ureteroscopy; Ureteral dilatation; Two-wire technique

CORRESPONDENCE: Wael M Gamal, MD, Department of Urology, Sohag University, 31 el nasr Street, Sohag, Egypt (wael_saad_el_dien@hotmail.com)

INTRODUCTION

Because of the advent of endoscopes, ureteroscopy has become increasingly available as a diagnostic and therapeutic modality with a low complication rate [1]. In the early series, in order to decrease the late complications of ureterolithotripsy with a rigid 11.5F ureteroscope such as distal-ureteral stricture, balloon or Teflon dilation of the intramural ureter was performed routinely [2]. The long-term complication rate of ureteroscopy in the study by Harmon et al [3] was only 0.5%. However, complications from balloon dilation may result if the balloon is overinflated [4].

The purpose of the present investigation was to introduce the two-wire technique. This technique is designed to overcome the drawbacks of the classic time-consuming balloon or Teflon dilation of the intramural ureter and ureteral perforation. In addition, it is designed to avoid intramural false passage that may occur during difficult ureteroscopy without any dilatation. The author reviews his experience with the two-wire technique to assess the safety and efficacy of acute dilatation of the intramural ureter for ureteroscopy.

METHODS

Participants

Between April 2004 and April 2007, 400 consecutive ureteroscopic procedures were performed by a single surgeon. Ureteroscopy was successful without any form of

UroToday International Journal®
original study
Ureteroscopy With Two Guide Wires: A New Technique

Figure 1. The First Wire Inside the Ureteric Orifice.
doi: 10.3834/uij.1944-5784.2009.06.10f1

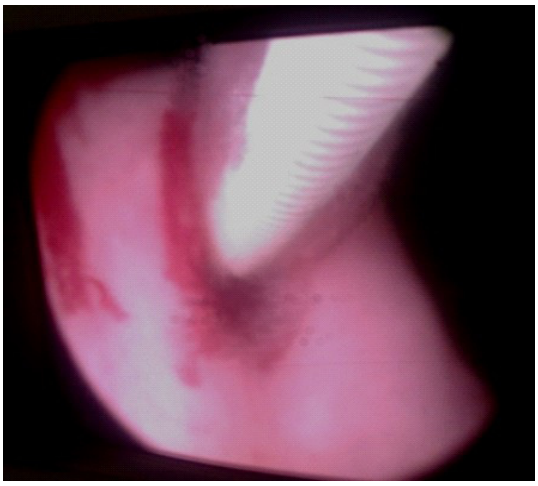


Figure 2. The Second Working Wire (Lower) Inside the Intramural Ureter and the Ureteroscope.
doi: 10.3834/uij.1944-5784.2009.06.10f2

dilation, but in 55 patients (40 male, 15 female) with a mean age of 28 years (range, 20-45 years) dilation of the ureteral orifice and intramural ureter was indicated. The 55 ureteroscopic procedures (32 right, 23 left) were for treatment of ureteral stones in 42 cases (32 distal, 8 mid, 2 proximal), ureteral stricture in 8 cases, diagnostic in 3 cases, and a retained stent in 2 cases.

Ureteroscopic Procedure

All ureteroscopic procedures were performed with the patient under spinal anesthesia with preoperative antibiotics administration. The patients were placed in a lithotomy position. They underwent acute dilatation of the intramural ureter by the two-wire technique.

The first guidewire (0.038) was placed into the ureter (Figure 1). After that, a second working guidewire (0.038; straight with flexible tip) was inserted through the working channel of the ureteroscope (8.5F–10F) into the ureter. Fluoroscopy was used to guide insertion until the renal pelvis was reached, in order to back load the ureteroscopy (Figure 2). Next, the ureteroscope was rotated so that it was between the first guidewire (outside the ureteroscope) and the second working guidewire (inside the ureteroscope) (Figure 3). The ureteroscope was then advanced into the ureter, bypassing the intramural segment (Figure 4).

RESULTS

The 55 patients underwent successful ureteroscopy with a semirigid ureteroscope with the two-wire technique. The mean operation time was 34 minutes (range, 20–70 minutes).

No patient required active dilation of the intramural ureter by balloon or Teflon dilators. Perforation or intramural false passage of the ureter did not appear, as seen by intraoperative ureteroscopy and confirmed by absence of extravasation by intraoperative retrograde pyelography.

No patient had febrile urinary tract infection after the procedure. All patients were discharged from the hospital within 6–12 hours.

A double-J stent was used for 4 weeks in 11 cases postoperatively (8 with ureteral stricture treated by endoureterotomy; 3 due to impacted stones). The remaining cases required no postoperative ureteral stents.

The mean follow-up was 9.7 months (range, 6–18 months). Ultrasonography, intravenous urogram, and voiding cystourethrography were obtained at 3 and 6 months. Ultrasonography was repeated every 3 months until the end of the follow-up period. Follow-up imaging showed no distal ureteral stricture or vesicoureteral reflux in any patient.

DISCUSSION

Technological advances in ureteroscopy have allowed for the development of smaller endoscopes to be used in children and adolescents. Although the ureteroscopes are smaller, many ureteral orifices are too small to pass the ureteroscope, thereby requiring dilation. Active dilation, by balloon and/or rigid dilation systems, has commonly been used in the adult population with minimal clinically significant morbidity [5].

Figure 3 The Two Wires Inside the Ureter; the Ureteroscope is Rotated to be Between Them.
doi: 10.3834/uij.1944-5784.2009.06.10f3

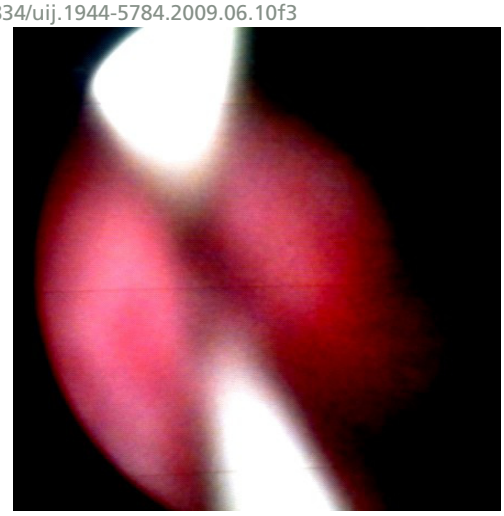
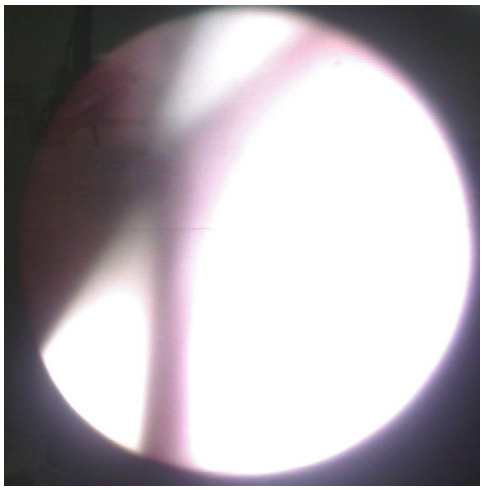


Figure 4 The Ureteroscope is Advanced on the Working Second Wire Inside the Ureter.
doi: 10.3834/uij.1944-5784.2009.06.10f4



In a study by Bassiri et al [6], 38% of 66 patients underwent balloon dilation and no patient had stenosis or stricture at the 3-month follow-up. In a study by Minevich et al [7] ureteral dilation was necessary in 23 patients (32.3%). Serial rigid dilators were used in 20 patients and balloon dilators in 3. In that study, 1 patient developed a distal ureteral stricture after balloon dilation and subsequently underwent laser incision. Although it is believed (but not proven) that controlled dilation using a balloon dilator or a gradually dilating catheter may be less traumatic to the ureter than dilation with the two-wire technique, none of the patients in the present study demonstrated ureteral stricture. This was confirmed by ultrasound and excretory urography at the 3 and 6 month follow-up.

The potential risk for development of vesicoureteral reflux is another concern regarding ureteral dilation before ureteroscopy. Although it has been shown that ureteral dilation does not increase the risk of significant reflux [8], most reported cases of postoperative reflux are low grade and resolve spontaneously [9]. In the present study, no patient had febrile urinary tract infection after the procedure or reflux on postoperative voiding cystourethrography.

Fasihuddin and Hasan [10] performed ureteroscopy in 125 consecutive patients. Technical failure to access the ureteral orifice was observed in 10 patients (8%). Three patients had passive dilatation with a ureteral catheter for 48 hours; 7 had failures attributable to the inability to traverse the ureter. All of the ureteroscopies were performed with an 8F rigid ureteroscope.

Gaylis et al [11] used a 6F/12F AQ hydrophilically coated tapered dilator for ureteral dilation in 80 consecutive patients undergoing rigid or flexible ureteroscopy. The ureteral orifice and intramural ureter were dilated successfully in all of the patients. The surgeons showed that the technique was a safe, effective, and inexpensive alternative to traditional dilation procedures. They determined that using the AQ dilator cost 20% of balloon dilation, a savings of approximately $764 per dilation. The technique in the present study uses only two guide wires; therefore, it will be cost effective compared with other types of dilation.

Unsal et al [12] performed ureteroscopy in 134 consecutive patients. An 8F semirigid ureteroscope was used without any ureteral dilatation. No ureteral stricture was encountered during the follow-up period. The authors suggested that ureteroscopic interventions could be performed easily for all parts of the ureter without previous dilatation.

Two-wire dilatation is less invasive than other dilatation techniques and does not routinely require postoperative stent placement for management of postoperative ureteral swelling and/or edema following acute dilatation of the intramural segment.

CONCLUSIONS

Acute dilatation of the intramural ureter by the two-wire technique is cost effective, easy, and time saving with no associated complications.

REFERENCES

[1] Hubert KC, Palmer JS. Passive dilation by ureteral stenting before ureteroscopy: eliminating the need for active dilation. *J Urol*. 2005;174(3):1079-1080.

[2] Katoh N, Sugiyama T, Itoh M, et al. Transurethral ureterolithotripsy with rigid ureteroscope: efficacy of balloon dilation of ureteral orifice and intramural ureter [in Japanese]. *Nippon Hinyokika Gakkai Zasshi.* 1993;84(9):1590-1594.

[3] Harmon WJ, Sershon PD, Blute ML, Patterson DE, Segura JW. Ureteroscopy: current practice and long-term complications. *J Urol*. 1997;157(1):28-32.

[4] Huffman JL, Bagley DH. Balloon dilation of the ureter for ureteroscopy. *J Urol*. 1988;140(5):954-956.

[5] Hill DE, Segura JW, Patterson DE, Kramer SA. Ureteroscopy in children. *J Urol*. 1990;144(2 Pt 2):481-493.

[6] Bassiri A, Ahmadnia H, Darabi MR, Yonessi M. Transureteral lithotripsy in pediatric practice. *J Endourol*. 2002;16(4):257-60.

[7] Minevich E, Defoor W, Reddy P, et al. Ureteroscopy is safe and effective in prepubertal children. *J Urol*. 2005;174(1):276-279.

[8] Jayanthi VR, Arnold PM, Koff SA. Strategies for managing upper tract calculi in young children. *J Urol*. 1999;162(3 Pt 2):1234-1237.

[9] Schuster TG, Russell KY, Bloom DA, Koo HP, Faerber GJ. Ureteroscopy for the treatment of urolithiasis in children. *J Urol.* 2002;167(4):1813-1816.

[10] Fasihuddin Q, Hasan AT. Ureteroscopy (URS): an effective interventional and diagnostic modality. *J Pak Med Assoc*. 2002;52(11):510-512.

[11] Gaylis F, Bastuba M, Bidair M, Friedel W. Ureteral dilation using a tapered dilator: A cost-effective approach. *J Endourol*. 2000;14(5):447-449.

[12] Unsal A, Cimentepe E, Balbay MD. Routine ureteral dilatation is not necessary for ureteroscopy. *Int Urol Nephrol*. 2004;36(4):503-506.

TO CITE THIS ARTICLE: Gamal WM. Ureteroscopy with two guide wires: a new technique. *UIJ* 2009 Jun;2(3). doi:10.3834/uij.1944-5784.2009.06.10