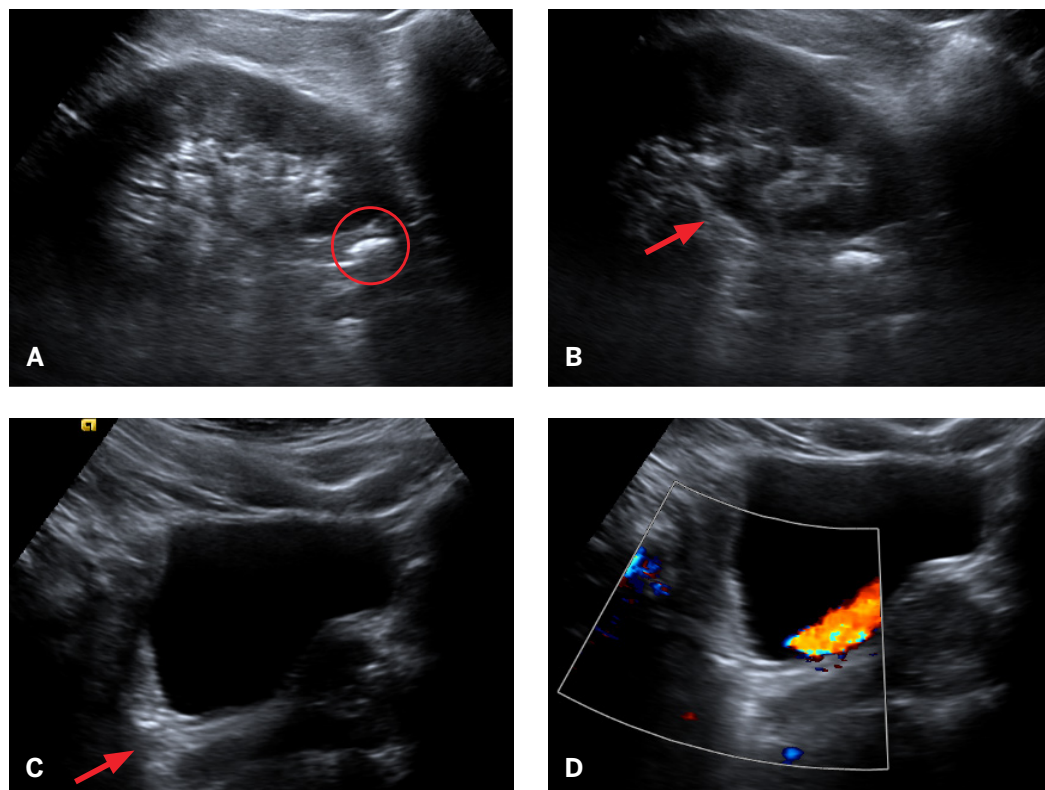


Bilateral Ureteroscopy

CASE 1 PRESENTATION

A 55-year-old male presented with an episode of left flank pain and hematuria. A CT urogram demonstrated a 3 x 3 mm stone in the left mid-ureter, with slight ureteral dilation but no hydronephrosis. The right kidney had an 8 x 6 x 4.7 mm stone in the renal pelvis without hydronephrosis. At the time of the visit, the patient was asymptomatic and elected a trial of stone passage. A renal ultrasound was planned in 2 to 3 weeks to assess for passage of the left ureteral stone. However, the patient did not return for 3 months, having not noticed stone passage and complaining of mild low back pain. A renal ultrasound demonstrated a 3 mm stone in the left distal ureter, with slight ureteral dilation and a good jet, and an 8 mm stone in the right proximal ureter, which was causing mild hydronephrosis; no ureteral jet was seen (Figure 1).

Figure 1. An 8 mm stone in the right proximal ureter (A). Mild hydronephrosis is better appreciated in image B. Image C shows a 3 mm stone in the left distal ureter; there is a preserved ureteral jet (D).



CASE OF THE MONTH

MEDICAL HISTORY AND LABORATORY FINDINGS

Obesity (BMI 31), diabetes, coronary artery disease

Urinalysis: 20 RBC, pH 5.0

Urine culture: negative

Creatinine: 0.85 mg/dL

MANAGEMENT

After a thorough discussion of treatment options, risks/benefits, and potential complications, the patient elected to have bilateral ureteroscopy and was taken to the operating room. The left ureteral stone was addressed first. The left distal ureter was narrowed and required dilation with an 8F/10F coaxial dilator. A semirigid ureteroscope was then passed into the distal ureter and a 3 mm jagged stone was encountered; it was fragmented with a 200 μ m laser fiber and the pieces were evacuated. No stent was placed. The right ureter was then cannulated with a wire that passed beyond a radiopaque stone in the proximal ureter. A 13F x 36 cm ureteral access sheath was passed over the wire into the mid-ureter and a flexible ureteroscope was then easily passed up to the stone, which was subsequently fragmented using the 200 μ m laser fiber. All stone fragments were evacuated using a nitinol basket and then the kidney and proximal ureter were examined to ensure there were no residual stone fragments. The ureter was examined during removal of the access sheath, and then a 5F x 26 cm stent was passed with a tether string secured to the dorsal phallus with a Tegaderm dressing. The stent was removed 3 days later. The patient did well. A follow-up ultrasound 6 weeks later showed no hydronephrosis and a single 1 to 2 mm fragment in the right lower pole. Stone composition was 90% calcium oxalate monohydrate, 10% calcium oxalate dihydrate.

CASE 2 PRESENTATION

A 28-year-old male presented after an episode of ureteral colic and subsequent passage of a 3 mm stone. A CT scan demonstrated several bilateral renal stones, each about 5 x 3 mm and with a dual energy ratio of 1.7 (suggestive of calcium stones); one in the right midpole and two in the left midpole; there were additional punctate stones in each kidney (Figure 2).

Figure 2. Bilateral midpole renal stones, each measuring approximately 5 x 3 mm.



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MANAGEMENT

After thorough counseling on treatment options, including observation and staged shock-wave lithotripsy, the patient elected to proceed with bilateral ureteroscopy. In the operating room, a flexible cystoscope was used to evaluate the bladder and a wire was passed up the right ureter into the kidney. A flexible ureteroscope was passed over the wire into the kidney; a few 1 mm stones were seen adherent to papillae and these were brushed free with the tip of the ureteroscope. The 5 mm stone was then fragmented into 3 smaller pieces using a 200 μ m laser fiber; two pieces were turned into dust. The remaining piece was removed with a basket. The left ureter was then cannulated with a wire and an 11.5F x 45 cm access sheath was passed. The stones were fragmented with a 200 μ m laser fiber and then all fragments were basketed and removed. The access sheath was removed as we evaluated the ureter with the ureteroscope, and a wire was replaced to facilitate passage of a 5F x 26 cm stent with a tether string secured to the dorsal phallus. The patient removed his stent 4 days later. A renal ultrasound 6 weeks post-op demonstrated no residual stone fragments or hydronephrosis. The stone was 100% calcium oxalate monohydrate.

COMMENT

Bilateral ureteroscopy offers several advantages over a staged procedure, including a single anesthesia, shorter overall operative time, and reduced convalescence as well as lower cost for the patient and the healthcare system.¹ Potential disadvantages include lower stone-free rate and, for patients with bilateral stents, urinary retention, increased stent colic, and more postoperative emergency department visits.

A study comparing single-session bilateral ureteroscopy vs. planned staged bilateral ureteroscopy demonstrated a shorter operative time for the single-session cohort, with no differences in stone-free rate or need for unplanned secondary procedures.¹ In addition, despite the fact that 73% of single-session bilateral ureteroscopy patients had bilateral stents placed, there was no difference in emergency department visits between the two cohorts.

A recent systematic review of bilateral procedures, including bilateral ureteroscopy, bilateral percutaneous nephrolithotomy, and ureteroscopy with contralateral percutaneous nephrolithotomy demonstrated no differences in stone-free rates (>90%) but fewer complications per renal unit for the bilateral procedures compared to staged procedures.²

A 2017 survey of members of the Endourological Society was performed to assess surgical management of bilateral stone disease; 85% of survey participants were willing to perform bilateral ureteroscopy.³

Most studies have evaluated elective bilateral ureteroscopy, primarily for renal stones or for a unilateral ureteral stone and a contralateral renal stone. However, the safety of bilateral ureteroscopy for bilateral obstructing ureteral stones, even in the setting of acute kidney injury, has also been established.^{4,5}

Efficient bilateral ureteroscopy can be performed with only a modest increase in operative time compared to a unilateral procedure and with minimal additional disposable equipment. Usually, obstructing ureteral stones should be addressed first. In the setting of bilateral renal stones, treating the smaller stone burden first may allow a stentless approach on that side and the same wire can then be reused on the contralateral side. In addition, the contralateral ureteral orifice can be identified with the ureteroscope rather than switching back to a cystoscope for this purpose.

CASE OF THE MONTH

At least one stent should be placed after the vast majority of bilateral ureteroscopies in ureters that were not pre-stented. Ureteral edema following ureteroscopy can cause transient ureteral obstruction; this is acceptable in the setting of a normal, unobstructed contralateral kidney; however, in the setting of bilateral ureteroscopy, failure to place at least one stent could lead to transient bilateral ureteral obstruction resulting in acute kidney injury. However, just as a stent is not required for every unilateral ureteroscopy, it is certainly reasonable (and preferable) to forgo a stent in one ureter when appropriate during bilateral ureteroscopy.

Bilateral stents should be considered in the setting of narrow ureters requiring significant dilation, the use of bilateral ureteral access sheaths, or large stone burdens with a large volume of residual small fragments or dust. Bilateral ureteral stones with impaction or moderate edema may also warrant the use of bilateral stents.

In the cases presented here, unilateral stents were placed in the renal unit with the larger stone burden, where an access sheath was employed. The contralateral renal units, which had a much smaller stone burden, did not require a stent.

When deciding whether to place unilateral or bilateral stents, it is helpful to first consider each renal unit separately. Advanced planning and patient counseling are important to manage postoperative expectations.

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Our renowned [urologic specialists](#) have pioneered numerous advances in the surgical and pharmacological treatment of urologic disease.

For questions and/or patient referrals, please contact us by phone or by e-mail.

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