CLINICAL CASE

Simultaneous bilateral ureterolithotomy through a single port


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Abstract  In 2007, through their clinical guidelines, the American Urological Association (AUA) and the European Association of Urology (EAU) recommended laparoscopy or open surgery as a treatment modality when extracorporeal lithotripsy or either antegrade or retrograde ureteroscopy had failed or were deemed likely to fail. The aim of this article was to demonstrate the versatility of single-port surgery as an alternative to conventional laparoscopic or open approaches in the treatment of upper urinary tract pathologies. A 35-year-old man with a past history of bilateral ureteral lithiasis of 6-month progression underwent failed left extracorporeal lithotripsy and double-J stent placement, as well as failed right ureteroscopy. A computed tomography urography (CTU) scan showed severe hydronephrosis, a stone in the left upper third measuring approximately 1.2 cm with 970 HU, and a right 1.4 cm stone with 1,050 HU. A kidney scintigram reported a glomerular filtration rate (GFR) of 60 mL/min, right kidney 55% and left kidney 45%. The simultaneous single-port procedure was performed. Surgery duration was 85 min, blood loss was 50 mL, and hospital stay was 2 days. Postoperative pain was managed exclusively with lisine chlorixinate, as needed. Bilateral single-port surgery is a good alternative to standard laparoscopic surgery in cases of suspected impacted stones or in those patients with a past history of failed procedures of extracorporeal shock wave lithotripsy (ESWL) or ureteroscopy.
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Introduction

In 2007 the American Urological Association (AUA) and the European Association of Urology (EAU) reported through their clinical guidelines that for stones in the upper third of the ureter of at least 1 cm, extracorporeal shock wave lithotripsy (ESWL) and ureteroscopy have a success rate of 74% and 93%, respectively. Therefore, these procedures were recommended as first-line treatment for 1 cm stones. In the case of impacted ureteral stones, anterograde percutaneous ureteroscopy may be considered a treatment option. Inasmuch as the 1997 AUA guidelines did not recommend open surgery as a first treatment option, in 2007 the AUA/EAU modified that recommendation, announcing or suggesting laparoscopic or open surgery as a treatment modality when ESWL and either antegrade or retrograde ureteroscopy have failed or are likely to fail. And so in such cases laparoscopic ureterolithotomy is recommended as a better option than open surgery and should be performed when it can technically be performed. Recent reports, that include unilateral and bilateral ureterolithotomy, have shown the versatility of single-port surgery in the upper urinary tract.

Case presentation

A 35-year-old man, with a body mass index (BMI) of 35 and a past history of bilateral ureteral lithiasis of 6-month progression, underwent a failed left extracorporeal lithotripsy and had placement of a double-J stent. He also had a failed right ureteroscopy. He was referred to the Urology Service 8 months after his initial diagnosis. A computed tomography urography (CTU) scan was taken that showed bilateral ureteral lithiasis with severe hydronephrosis. He also had loss of the parenchyma in both kidney units, for which a kidney scintigram was ordered before surgery. The CTU scan reported a stone in the left upper third measuring approximately 1.2 cm with 970 HU and a right 1.4 cm stone with 1,050 HU (fig.1). The kidney scintigram reported a glomerular filtration rate (GFR) of 60 mL/min, right kidney 55% and left kidney 45% and a urine culture that was positive for *Escherichia coli*. After ciprofloxacin administration, a repeat urine culture was negative.

The patient underwent single-port simultaneous bilateral ureterolithotomy with the following surgical technique: after general anesthesia, an unsuccessful attempt was made to endoscopically remove the double-J stent. The patient was placed in the left lateral decubitus position, the
position of the surgical table flexion was at the level of the umbilicus, and the pressure points were protected. A 4 cm incision was made in the abdominal cavity where the Alexis® Wound Retractor (Applied Medical, Rancho Santa Margarita, CA) was then placed, and over it, the GelPOiNT Advanced Access Platform™ (fig. 2). After creating the pneumoperitoneum at 12 mm Hg and a flow of 5 L per minute, we identified the line of Toldt and medially mobilized the colon, exposing the perirenal fat and the upper third of the ureter that had abundant fibrosis from the previous ESWL. A ureterotomy of approximately 2 cm was performed, extracting the calcified stent and the stone. A retrograde 6 x 26 Fr double-J stent was placed with a flexible cystoscope and ureterorrhaphy with Monocryl™ 3-0 running sutures was done (fig. 3). Afterwards, the gelPOINT device was removed, the surgical wound was covered, and the patient was placed in the right lateral decubitus position. The same procedure was performed, now placing a percutaneous anterograde 6 x 26 Fr double-J stent and extracting both stones through the gelPOINT; the Penrose drain was left in place (figs. 4 and 5).

Surgery duration was 85 minutes, there was a 50 mL blood loss, and hospital stay was 2 days. The patient was released and the Foley catheter was removed on the 5th postoperative day. Postoperative pain was managed only with 100 mg of lysine clonixinate, as needed. The double-J stents were removed 6 weeks after surgery. A new kidney scintigram was taken at the 4th postoperative month and showed kidney function improvement: GFR 72 mL/min in the right kidney, and 57 mL/min in the left kidney.

Discussion

Currently ESWL, ureteroscopy, and percutaneous anterograde surgery are accepted as treatments for stones that measure approximately 1 cm or larger. Sometimes endourologic management fails and if more advanced technology (flexible, holmium laser) is not available or if a treatment with a higher success rate is preferred, ureterolithotomy is the next option. 5-9

The development of laparoscopic procedures and technologic advances have been responsible for laparoscopy’s replacing open surgery as a good surgical option. 10,11

In 1992 Raboy et al. were the first to report on transperitoneal ureterolithotomy. 12 Single-port surgery has advantages over conventional laparoscopic surgery. The latter requires 3 or 4 ports or incisions, and in some cases, another larger incision for extracting the resected organ. 12,13 In contrast, single-port surgery employs a single incision above the umbilicus, without sectioning the muscles or ligaments that could cause more pain. Moreover, as in our case, a bilateral procedure can be performed through the same incision. 14-17

The first report on single-port surgery for ureterolithotomy was published in 2008 by Rane et al. 7 and the first study on bilateral ureterotomy was conducted by Lee et al. in 2011. 14 Articulated instruments were used in the majority of these studies, which makes the procedure more expensive. We have preferred to use the GelPOiNT Advanced Access Platform™ because it utilizes conventional instrumentation. Bilateral procedures are a good indication for transumbilical surgery. Some studies have shown that when impacted stones are suspected, single-port surgery for ureterolithotomy is a good alternative. 1 The combination of flexible ureterorenoscopy and holmium laser is a more effective ureteroscopic modality. However, not all centers are equipped with this technology. 1 Although it has not been well demonstrated, we have noted that patients undergoing single-port surgery have less pain than with conventional laparoscopic surgery. In short, surgery duration is acceptable, as is the final result with little pain and a fast recovery.
Conclusions

Bilateral single-port surgery is a good option in relation to standard laparoscopic surgery, especially in cases of suspected stone impaction, in patients with a past history of failed ESWL or ureteroscopy, and in cases of bilateral lithiasis.

Conflict of interest

The authors declare that there is no conflict of interest.

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References