

# Surgical technique of laparoscopic ureterocalicostomy using the VIO soft-coagulation system

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## Abstract

One of the most crucial issues while performing ureterocalicostomy (UC) in patients with well-functioning thick renal parenchyma is controlling bleeding from the anastomotic site. In general, renorrhaphy is necessary for hemostasis because conventional coagulation remains unreliable in cases of an incised thick renal parenchyma. Instead of the parenchymal renorrhaphy, the VIO soft-coagulation system is used for hemostasis. Sutureless hemostasis using soft coagulation is a safe, feasible, and minimally invasive technique for laparoscopic UC.

**Keywords:** Laparoscopy, soft-coagulation system, ureterocalicostomy

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## INTRODUCTION

Ureterocalicostomy (UC) is a surgical option for the reconstruction of a complicated ureteropelvic junction (UPJ) obstruction with a proximal ureteral stricture. Advanced skills, such as the use of tension-free sutures and ability to control bleeding from the incised renal parenchyma, are required for this procedure. Recently, laparoscopic and robotic UC has successfully been performed.<sup>[1,2]</sup> One of the concerns in performing UC is the thickness of renal parenchyma for lower pole amputation. Most reported UC cases had a thin renal parenchyma, particularly in the lower pole.<sup>[1,3-5]</sup> However, in patients with thick renal parenchyma, the control of bleeding from the anastomotic site is one of the most crucial issues. Herein, we introduce our minimally invasive sutureless technique using the soft-coagulation system in laparoscopic UC.

## CASE REPORT

The patient was a healthy 33-year-old man who presented with symptomatic UPJ obstruction. A computed tomography scan showed left hydronephrosis and an adequate parenchyma in the lower pole with stones. Retrograde pyelography was attempted; however, the guidewire could not pass beyond the UPJ. A percutaneous drainage procedure and nephrostogram were performed, which confirmed complete UPJ blockage.

Owing to the presence of an intrarenal pelvis, the decision of laparoscopic UC was made. A transperitoneal approach was implemented in a lateral flank position. Four trocars were inserted in a manner similar to that performed in laparoscopic pyeloplasty; the ureter was transected distal to the stricture level and then spatulated in preparation for anastomosis. The kidney

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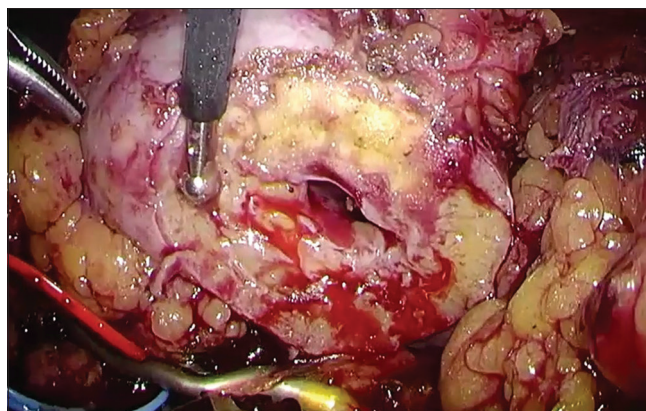
was mobilized to the extent needed to perform the anastomosis without tension. Vascular clamping was needed in the present case owing to the thick renal parenchyma in the lower pole. A lower pole nephrectomy was performed, removing as much parenchyma as necessary to widely expose a lower pole calyx. We used VIO 300D (ERBE Elektromedizin GmbH, Tübingen, Germany) to maintain the hemostasis of the resected kidney surface. The ball electrode connected to VIO 300D was placed against the bleeding point [Figure 1]. The device was set in a “soft coagulation” mode (80 W, Effect level 7). Careful attention was paid to ensure that the lower pole of the calyceal opening was not cauterized. The resected surface of the kidney was treated by soft coagulation without renorrhaphy, following which the clamp on the renal artery was released after 17 min. A flexible cystoscope was introduced through a trocar and passed through the open lower pole calyx to remove the renal stones [Figure 2]. A wide, spatulated end-to-end ureterocalyceal anastomosis was performed using 4-0 absorbable sutures [Figure 3]. A double-pigtail catheter was inserted in antegrade fashion, and the anastomosis was completed. Gerota’s fascia was wrapped over the anastomotic site. At postoperative 1 year, the patient was asymptomatic with a significant reduction in hydronephrosis.

## DISCUSSION

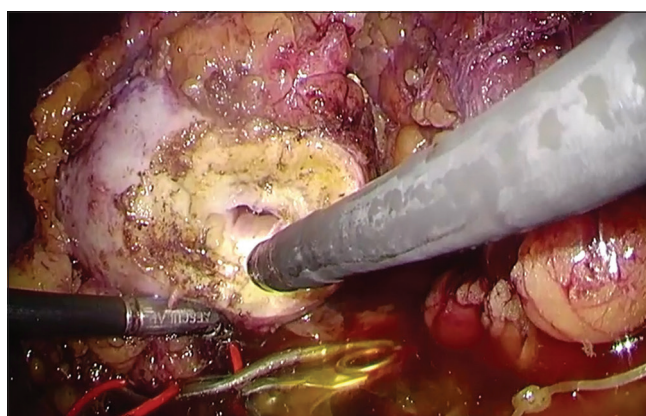
Bleeding from the incised renal parenchyma and the risk of anastomotic stricture are critical issues in UC. The kind of hemostasis technique that is most useful for lower pole nephrectomy remains undetermined.

The soft-coagulation system is being used in the field of surgery.<sup>[6]</sup> Some studies have reported the effectiveness of the soft-coagulation system for partial nephrectomy without renorrhaphy.<sup>[7,8]</sup> The soft-coagulation system generates only Joule heat without producing sparks that can cause tissue carbonization. Conventional coagulation systems produce sparks and can cause carbonization. Furthermore, the soft-coagulation system degenerates protein to a depth of <2 mm from the resected surface.<sup>[7,9]</sup> Because the heat produced by the soft-coagulation system is localized, renal function damage may be limited.

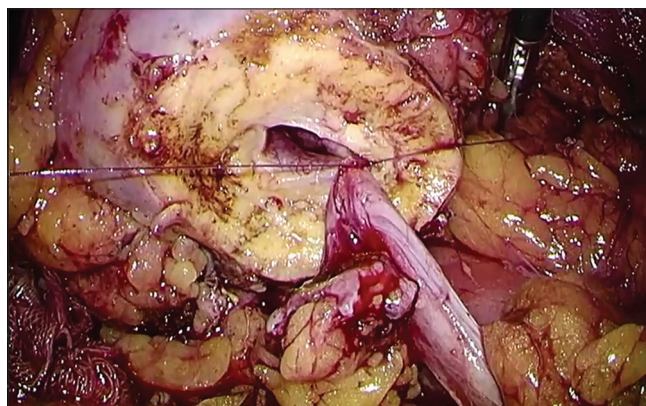
Although renorrhaphy is the gold standard for managing bleeding from the kidney, renorrhaphy was not performed because a puncture with a suture needle is one of the causes of false aneurysm. Mesrobian advocated closing the lower pole capsule over the renal parenchyma to buttress the anastomosis in UC.<sup>[10]</sup> However, this maneuver



**Figure 1:** Bleeding from the incision site was controlled with the soft-coagulation system



**Figure 2:** A flexible cystoscope was introduced through the open calyx



**Figure 3:** Ureterocalyceal anastomosis was performed using 4-0 polyglactin sutures

may compromise the lumen by extrinsic compression. The soft-coagulation system is advantageous because it involves a shorter ischemia time than that observed in renorrhaphy.

## CONCLUSION

Sutureless hemostasis using soft coagulation is a safe and minimally invasive technique for laparoscopic UC.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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