Video

Single-port robot-assisted pyeloplasty through supine anterior retroperitoneal access

Sina Sobhani, Sij Hemal*

Norris Comprehensive Cancer Center, Institute of Urology, University of Southern California, Los Angeles, CA, USA
*E-mail: kshitij.hemal@med.usc.edu

ABSTRACT

This video explores the technique of robot-assisted pyeloplasty using the Da-Vinci Single-Port robot through the supine anterior retroperitoneal access in a 28-year-old male with a right-sided ureteropelvic junction obstruction. The patient was placed in a supine position, with a 10°–20° elevation of the ipsilateral flank. Retroperitoneal access was obtained at the McBurney's point for the placement of the port. The standardized steps of the Anderson–Hynes pyeloplasty technique were executed. Operative time was 120 min with 10 mL of blood loss. The patient was discharged on the same day without complications. At 4-months follow-up, on the renal scan, the right kidney showed stable function with improved drainage.

OBJECTIVE

We present a novel technique for retroperitoneal Anderson–Hynes dismembered pyeloplasty via the supine anterior retroperitoneal access (SARA) using the Da-Vinci Single-Port (SP) robot for treating right-sided ureteropelvic junction obstruction (UPJO) with a potential improvement in the perioperative morbidity [Video 1].[1-3]

METHODS

Twenty-eight-year-old male presented with severe right flank pain. His medical, surgical, and family history were noncontributory. Computed tomography scan suggested a right-sided UPJ obstruction due to a crossing vessel. A nuclear medicine renal scan showed a $T_1/_2$ of 19.4 min with 46% function in the right kidney, compared to a $T_1/_2$ of 6.6 min with 54% function in the left kidney. His serum creatinine was 0.8 mg/dL. The patient was placed in a supine position, with 10°–20° elevation of the ipsilateral flank. Retroperitoneal access was obtained, starting with an incision at the McBurney's point. Using a muscle-splitting technique, the dissection proceeded through the Camper's and Scarpa's fascia until the external oblique fascia was visualized. An incision was made on the external oblique fascia, and blunt dissection continued through the internal and external oblique and transversalis muscles, allowing entry into the retroperitoneal space. Finger dissection was used to expand the retroperitoneal space lateral to the peritoneum, extending until the ipsilateral anterior superior iliac spine was palpable. Gentle finger dissection was performed medially to push the peritoneum away from the transversus abdominis muscle, creating sufficient space for the insertion of the SP access kit. We employed the Anderson–Hynes pyeloplasty technique. Principles included ensuring mucosal apposition, allowing for proper alignment, and a watertight seal between the ureter and renal pelvis. We utilized a no-touch technique during the anastomosis, carefully handling the ureter without direct manipulation to minimize tissue trauma and ischemia. In addition, we prioritized the preservation of the periureteral tissues in order to maintain the vascularity

Video available on: www.indianjurol.com

Access this article online

Quick Response Code:

Website: www.indianjurol.com

DOI: 10.4103/iju.iju_389_24

Received: 02.10.2024, **Revised:** 30.10.2024,

Accepted: 31.10.2024, **Published:** 01.01.2025

Financial support and sponsorship: Nil.

Conflicts of interest: There are no conflicts of interest.

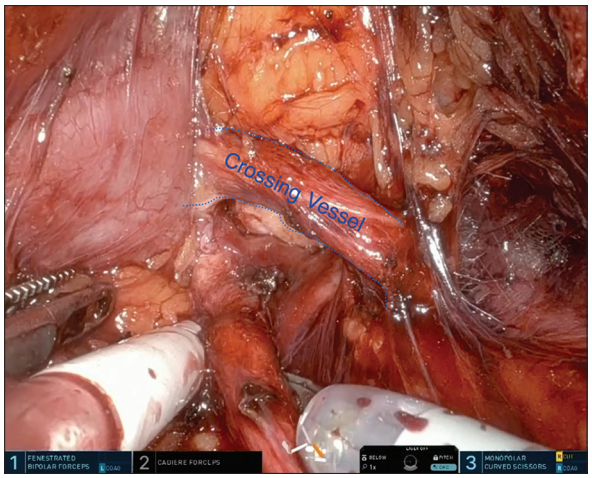

Figure 1: Exposure of crossing vessel after the renal pelvis is mobilized using the Da-Vinci Single-Port Robot

for optimal healing and reducing the risk of restenosis. Surgical steps included: (1) dissection of ureter, UPJ, and renal pelvis [Figure 1], (2) UPJ transection and ureteral spatulation, (3) placement of the ureteral stent, and (4) completion of anastomosis.[4,5]

RESULTS

The surgery was successful with no complications, an estimated blood loss of 10 mL, and a 120-min operative time (90-min console time). The patient was discharged on the same day with no need for narcotics. The Foley's catheter was self-discontinued by the patient on postoperative day 1 and the ureteral stent was removed 4 weeks postoperatively. A follow-up nuclear medicine renal scan, at 4 months postoperatively, demonstrated an improved $T_1/_2$ of 9.2 min with stable 48% function in the right kidney and $T_1/_2$ of 5.4 min with 52% function in the left kidney. His glomerular filtration rate remained stable at 110 mL/min/1.73 m².

CONCLUSIONS

SP-robot-assisted retroperitoneal pyeloplasty through SARA is feasible for treating UPJO. It allows regionalization of the surgery to the retroperitoneum with expeditious access to the target anatomy while minimizing the surgical dissection. This approach is advantageous for patients with a deep body habitus, improving the access to deep structures without retractors, and enabling supine positioning. Minimal postoperative pain supports the same day discharge, reducing costs and enhancing patient comfort, making outpatient surgery feasible.

Link for video

https://drive.google.com/drive/folders/1r-e7fzthS7sPRu_0YNqSyzHJNawLKQk3?usp=sharing.

Declaration of patient consent

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

REFERENCES

1. Hemal S, Sobhani S, Hakimi K, Rosenberg S, Gill I. Single-port robot assisted partial cystectomy for urachal adenocarcinoma. Int Braz J Urol 2024;50:659-60.
2. Mehrazin R, Ranti D, Altschuler J. Early perioperative outcomes of single-port compared to multi-port robot-assisted laparoscopic partial nephrectomy. J Robot Surg 2023;17:2409-14.
3. Sobhani S, Hemal S. Single-port extraperitoneal robotic radical prostatectomy in a patient with a hostile abdomen. Indian J Urol 2024; 40:279-80. DOI: 10.4103/iju.iju_188_24.
4. Beksac AT, Wilson CA, Lenfant L, Kim S, Aminsharifi A, Zeinab MA, *et al.* Single-port mini-Pfannenstiel robotic pyeloplasty: Establishing a non-narcotic pathway along with a same-day discharge protocol. Urology 2022;160:130-5.
5. Lenfant L, Wilson CA, Sawczyn G, Aminsharifi A, Kim S, Kaouk J. Single-port robot-assisted dismembered pyeloplasty with mini-Pfannenstiel or Peri-umbilical access: Initial experience in a single center. Urology 2020;143:147-52.

How to cite this article: Sobhani S, Hemal S. Single-port robot-assisted pyeloplasty through supine anterior retroperitoneal access. Indian J Urol 2025;41:73-4.