

Oncology

Robotic Assisted Common Sheath Ureteroneocystostomy of an Injured Ectopic Ureter Diagnosed in the Acute Post-operative Setting after Robotic Assisted Radical Prostatectomy



Matthew Rohloff*, Cody Christensen, Thomas Maatman

Metro Health Hospital, University of Michigan Health, USA

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ABSTRACT

Radical prostatectomies are one of the most commonly performed operations for the robotic urologist. When a rare anatomic anomaly leads to an unrecognized intraoperative injury, standard postoperative management becomes complicated. We present the case of a patient with an iatrogenic injury to an ectopic ureter that underwent a robotic assisted common sheath ureteroneocystostomy three days post robotic assisted radical prostatectomy.

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Introduction

In the age of increased visualization with robotic technology, ureteral injuries are exceedingly rare and occur in less than 0.01% of robotic assisted radical prostatectomies (RARP).¹ While uncommon, anatomic aberrations to the male genitourinary tract increases the likelihood of intraoperative ureteral injuries. With an incidence less than 0.001% of the total male population, ectopic ureteral insertion into the prostate is an anomaly most robotic urologists have never been exposed to.² Discussed below is the management of a 60-year-old male found to have an ectopic ureteral injury identified two days post-RARP.

Case report

A 60-year-old male with no prior history of incontinence or voiding issues was diagnosed with T1c, 3+4 adenocarcinoma of the prostate via a transrectal ultrasound and biopsy. There was no pre-operative imaging. He subsequently underwent a successful RARP with clear margins. On post-operative day one, the patient was doing well, but JP drain output was 530 mL over 24 hours. On post-operative day two, the JP output remained elevated with 675 mL of

yellow serous fluid. Due to the elevated output, a JP creatinine was obtained and showed >50 mg/dL, which was elevated above the patient's serum creatinine of 1.057 mg/dL. A CT urogram showed a left sided duplicated collecting system with the ureter of the upper pole moiety excreting contrast into the pelvis (Fig. 1). This constellation of findings led to the diagnosis of an intraoperative ectopic ureteral injury that previously drained into the prostatic urethra.

On post-operative day three, the patient was taken back to the operating room for a robot assisted abdominal exploration with common sheath ureteroneocystostomy. The patient was placed in the steep dorsal lithotomy position and the Foley catheter was exchanged to optimize sterility. The same six port sites used during the RARP were used again for this operation. The sigmoid colon was retracted medially to expose the ureters (Fig. 2). The ureters were traced down to the entrance of the bladder, doubly clipped with Hem-o-Lok clips and transected. Two ureteral lumens were appreciated in a common sheath. One drained the upper pole moiety and appeared moderately dilated, while the other drained the lower moiety and appeared normal in caliber. The ureters were then spatulated and conjoined together (Fig. 3). Next, perivesical fat was identified and removed to expose muscularis and mucosa on the dome of the bladder. Two double-J stents were placed in a retrograde fashion towards the kidney. The ureters were successfully anchored to the bladder in a tension free and watertight anastomosis. Another JP drain was left to assure no post-operative leakage of urine. The console time of the

* Corresponding author.

E-mail address: matthew.rohloff@metrogr.org (M. Rohloff).

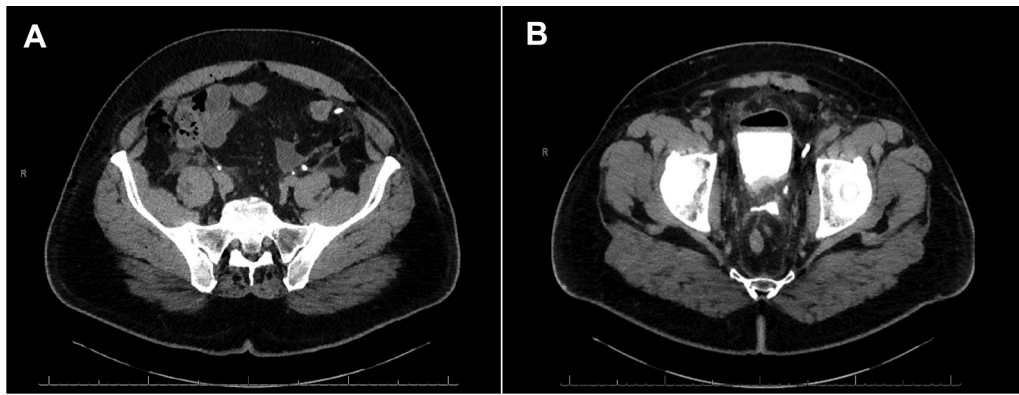


Figure 1. A) CT abdomen and pelvis 10 minute delayed axial image shows duplicated ureters on the patients left. B) CT abdomen and pelvis 10 minute delayed axial image shows contrast in the bladder as well as extravasation of contrast into the pelvis.

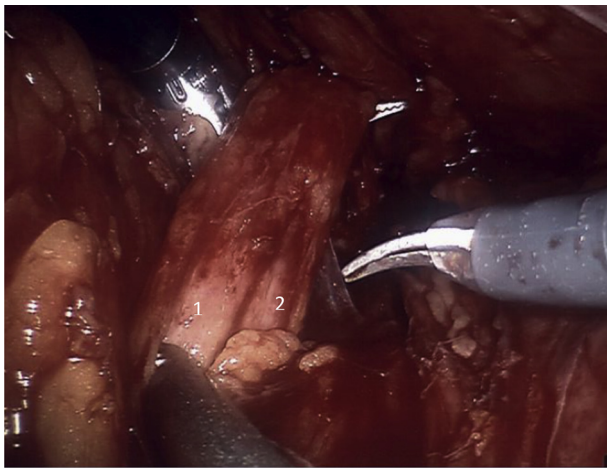


Figure 2. Intraoperative view of duplicated ureters in a common sheath. 1 = moderately dilated ureter draining upper pole moiety. 2 = normal caliber ureter draining lower pole moiety.

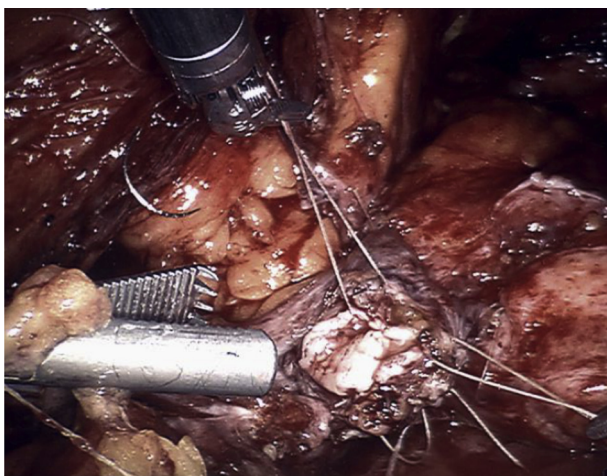


Figure 3. Intraoperative view of ureteral spatulation and anastomosis.

operation was under 120 minutes and the estimated blood loss was 13 mL. The abdomen was closed in the usual fashion and the patient was taken to the post anesthesia care unit in stable condition.

The remainder of the patient's hospitalization remained uneventful. The patient was discharged on post-operative day six from the RARP and post-operative day three from robotic assisted common sheath ureteroneocystostomy. The day of discharge, serum creatinine was 0.794 mg/dL and his JP drain had <70 mL of serosanguineous output. A fluoroscopic cystogram prior to the patient's first office visit was obtained and showed no persistent extravasation of urine. The JP drain and Foley catheter were removed in the office one-week post hospitalization. The double J stents were removed 14 days post operatively.

Discussion

To our knowledge there is one reported case of a RARP with an ectopic ureteral injury treated robotically in the acute post-operative setting. Due to the presumed pelvic inflammation and poor dissection planes, the surgeons opted to utilize a robotic assisted ipsilateral ureteroureterostomy.³

During initial inspection of our patient's pelvis, there was minimal postoperative inflammation. It was decided that a common sheath ureteroneocystostomy would be most advantageous given the circumstances. Our decision to utilize a common sheath ureteroneocystostomy over a ureteroureterostomy was also supported by the literature.⁴ Although minimal, separation of the duplicated ureters needed to gain exposure for the ureteroureterostomy can compromise the shared blood supply that runs longitudinally between the two ureters. This could potentially lead to an increased rate of anastomosis failure and stricture. Additionally, performing a ureteroureterostomy at a more proximal location has been shown to decrease the risk of urinary stasis associated with a more distal anastomosis. The amount of cephalad dissection required to gain exposure to the proximal ureteral sheath would have increased operative time and exposed additional intraoperative risks.

Our technique to utilize a robotic assisted common sheath ureteroneocystostomy showed advantageous outcomes for this patient. With minimal blood loss, less than 120 minutes of console time, no additional incisional sites and decreased operative risks associated with ureteroureterostomy, we have provided an option for management of an ectopic ureteral injury found in the acute post-RARP setting.

Conclusion

While uncommon, it is important for the robotic urologist to be aware of potential anatomic aberrations that can lead to post-operative morbidity. Unidentified ectopic ureteral insertion into the prostate identified on postoperative day two provided a unique presentation of an iatrogenic ureteral injury. Utilizing the same port sites as a RARP, we were able to successfully identify the common sheath of the duplicated ureters and perform a common sheath ureteroneocystostomy without complication.

Conflict of interest

No competing financial interests exist.

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