Prophylactic ureteral catheter placement for minimally invasive colorectal surgery

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ABSTRACT

Ureteral catheter placement for identification of ureters during colorectal surgery has been a controversial subject with ill-defined indications. We present a case of ureteral catheter placement wherein the patient required readmission for renal failure with intervention under local anesthesia. This case highlights the importance of patient selection for catheter placement and clinical follow-up, as well as the need for prospective studies to determine the risk-benefit ratio of preoperative catheters.

KEYWORDS Colorectal surgery; ureteral catheter; ureteral identification

Ureteric injury after colorectal surgery ranges from 0.2% to 10%, with its rarity making it difficult to study.^{1–3} Iatrogenic ureteral injury may be increased with laparoscopic surgery; the injury rate is 0.6% for open procedures vs 1.0% for laparoscopic procedures. Although rare, this injury can be detrimental to the patient's postoperative course.⁴ Catheters may play a role in identifying ureteral injury during surgery, although they have not been well studied in prospective trials. If injury is recognized intraoperatively, the success rate of ureteral repair is substantially improved.⁵ This case highlights the importance of further prospective studies to determine the risk-benefit ratio of preoperative catheters.

CASE REPORT

A 65-year-old woman presented to the clinic with thin stools and a history of diverticulitis. Her creatinine was 0.75 mg/dL with no previous renal problems or clotting disorder. Colonoscopy identified a transverse sigmoid stricture and diverticulosis. Transvaginal ultrasound confirmed two left ovarian cystic masses, and the patient desired permanent sterilization. Robot-assisted laparoscopic low anterior resection with concurrent bilateral salpingo-oophorectomy was planned with bilateral 5-French open-ended catheter placement prior to that. The operation proceeded as planned with no apparent abnormalities during cystoscopy. An open-

ended catheter was placed over guidewire. Low anterior resection and bilateral salpingo-oophorectomy proceeded as expected. The entire case lasted 5 hours and 37 minutes, with 30 cc blood loss, 1000 cc crystalloid given, and 225 cc of urine output during the case.

Staged removal of catheters was performed on postoperative days 1 and 2 and the patient was discharged on day 3 after voiding spontaneously. Urine output remained adequate and her creatinine was 0.98 mg/dL at discharge. Pathology revealed acute on chronic diverticulitis. On postoperative day 4 she returned to the emergency room with anuria for over 36 hours; repeat creatinine was 5.2 mg/dL, and a Foley catheter was placed with minimal output. A computed tomography scan revealed bilateral hydronephrosis with hyperattenuating material filling the bilateral renal pelvis and ureter (*Figure 1*). She was admitted to the hospital and underwent cystoscopy and bilateral catheter placement on postoperative day 5. During cystoscopy, she was found to have bilateral hydronephrosis on retrograde pyelogram, with filling defects in the renal pelvis consistent with clot and hematuria effluxing from both ureteral orifices. Double-J indwelling ureteral stents were placed bilaterally. Her creatinine was back to baseline by postoperative day 7, and she was discharged home. Ureteral stent removal in the clinic was planned 3 weeks after placement. She had minimal stent discomfort and full recovery at outpatient follow-up.

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Figure 1. Bilateral renal pelvis dilatation containing heterogenous material representing clot burden, with moderate hydronephrosis.

DISCUSSION

The use of catheters for identification and preservation of the ureter during laparoscopic colorectal surgery has increased over the past decade, especially when there is concern for difficult ureteral identification due to inflammation, bulky tumor, prior radiation, or diverticulitis.⁶ Criteria for catheter placement often vary from institution to institution. Although complication rates of catheter placement are low, they should not be overlooked. Complications of prophylactic ureteral catheter placement for identification during colorectal surgeries occur in approximately 2% of cases.^{3,7} These complications often require minimal intervention such as endoscopic retrograde or percutaneous catheter placement. Our patient required readmission for renal failure with intervention under local anesthesia. She experienced an unusual bilateral ureteral clot burden, which is rare after catheter placement unless catheter migration or unusually traumatic placement occurs. Cases of reflex anuria and clot retention have led to some surgeons opting for sequential catheter removal or unilateral catheter placement.

A study of 40,000 laparoscopic surgical cases identified a 4.2% utilization of catheters for identification during laparoscopic colorectal surgery.⁸ No significant difference was identified in morbidity or mortality in patients who had catheters

placed. Although catheters may play a role in identification of ureter or ureteral damage during colorectal surgery, placement may prolong operating time and carries a risk of ureteral injury, hematuria, and anuria caused by urothelial edema or clot burden.³

Discretion should be used when choosing patients for catheter placement, and further prospective trials are needed. With trends toward less invasive laparoscopic or robotic surgery, prophylactic catheter usage continues to increase. This case highlights the importance of patient selection for catheter placement and clinical follow-up, with a high suspicion for complications postoperatively.

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