

Utilization of Ureteral Light-Guided Catheters in Laparoscopic Surgery: A Single-Center Experience

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Background

✓ Ureteral injury is a severe complication in pelvic surgery, with an incidence up to 2.5%.

✓ Despite meticulous surgical technique, intraoperative ureter identification can be challenging, particularly in cases involving prior operations or extensive inflammation.

(Alexis Litchinko et al. Front Surg. 2026.)

✓ A ureteral illumination catheter with near-infrared (NIR) light enables visualization and safer dissection. We report our experience with the infrared illumination system (IRIS; Stryker) during colorectal procedures involving unclear ureteral boundaries.



Methods

✓ Retrospective review (n=9)

✓ October 2021 – August 2025

✓ Catheter placement by urologist under general anesthesia

✓ Removed after surgery

✓ Indications for IRIS Placement (invasion / inflammation / prior surgery)

Indications for IRIS Placement

Colorectal cancer

- Suspected ureter/bladder invasion → post-NAC curative surgery
- Locally recurrent tumors

Others

- Diverticulitis
- Enterovesical fistula with chronic inflammation

NAC ; Neoadjuvant Chemotherapy

Result

✓ **Successful ureteral visualization in all cases**

✓ **No ureteral injuries observed**

✓ **No catheter related complications**

Result 1						
Age / Sex	Diagnosis	Surgical Procedure	Type of surgery at commencement of operation	Ureteric visualization	ureteral injuries	catheter-related complications
43 M	recurrent rectal cancer (peritoneal recurrence)	LAR (with seminal vesicle resection)	Laparoscopic	Yes	No	No
68 M	recurrent rectal cancer (lateral pelvic lymph node)	LPLND (Left)	Laparoscopic	Yes	No	No
72 M	sigmoid cancer (with bladder invasion)	Sigmoid colectomy (with partial cystectomy)	Laparoscopic	Yes	No	No
62 M	rectal cancer (with bladder invasion)	LAR (with partial cystectomy)	Laparoscopic	Yes	No	No
76 M	sigmoid cancer (with bladder invasion)	Sigmoid colectomy (with partial cystectomy)	Laparoscopic	Yes	No	No
73 F	colovesical fistula (secondary to sigmoid diverticulitis)	Sigmoid colectomy	Laparoscopic	Yes	No	No
56 M	sigmoid diverticular perforation	Sigmoid colectomy	Laparoscopic	Yes	No	No
68 M	rectal cancer (with bladder invasion)	HAR	Laparoscopic	Yes	No	No
57 M	colovesical fistula (secondary to sigmoid diverticulitis)	Sigmoid colectomy	Laparoscopic	Yes	No	No

LAR ; Low anterior resection , LPLND ; lateral pelvic lymph node dissection, HAR ; high anterior resection

Case Presentation

A 72-year-old man

【Diagnosis】

Sigmoid colon cancer with direct bladder invasion

【Pretreatment diagnosis】

Sigmoid colon cancer, type 3, 68 mm, well-differentiated tubular adenocarcinoma (tub1). cT4b (urinary bladder), cN1a, cM0, cStage IIIC (UICC 7th edition). RAS mutant.

【Before NAC】

Sigmoid colon cancer with bladder invasion

【Post-treatment diagnosis】

Sigmoid colon cancer, type 5, 24 mm. ycT4b (urinary bladder), ycN0, ycM0, ycStage IIC (UICC 7th edition).

【After NAC】

NAC ; Neoadjuvant Chemotherapy

SOX plus bevacizumab (6 cycles) (S-1, oxaliplatin, and bevacizumab)

【Intraoperative findings】

medial-to-lateral approach for left colon mobilization

Partial cystectomy was performed with tumor resection under visualization of the fluorescently labeled ureteral orifices.

The bladder wall defect was closed by suturing under visualization of the fluorescently labeled ureteral orifices.

Result 2		
Patient Factor	Subgroup	n=9
Sex (%)	Female	1
	Male	8
Mean age at operation (SD)		63.8 (10.5)
BMI (SD)		22.2 (4.2)
Surgical indication (%)	Diverticular disease	3 (33.3)
	Malignancy	6 (66.7)
Number of prior abdominal operations(%)	0	2(22.2)
	1	6(66.7)
	2	0(0)
	>2	1(11.1)

Operative outcomes	
Ureteric injury(%)	0(0)
Ureteric visualization(%)	9(100)
Median stent insertion time(range)	20(17-23)
Median total surgical time(range)	256(210-563)
Convert to Open(%)	1(11.1)

Discussion

✓ Ureteral illumination catheters are considered useful for preventing ureteral injury in pelvic surgeries, including those in the gastrointestinal field, and they are expected to be increasingly utilized. Previous reports suggest a low complication rate associated with their use.

(Alexis Litchinko et al. Front Surg. 2026.)

✓ On the other hand, challenges include prolonged general anesthesia during catheter placement, the requirement for urological assistance, and additional costs.

(Ryu S, et al. Anticancer Res. 2026.)

Conclusion

IRIS provided consistent intraoperative ureter visualization and safe identification during laparoscopic colorectal surgery with an increased risk of ureteral injury. This technique appears valuable for preventing ureteral injury in complex pelvic operations.

Disclosures:
The authors have no conflicts of interest to disclose.