Fluoroscopic Retrograde Brush Cytology Through Ileal Conduit

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INTRODUCTION AND OBJECTIVES

The prevalence of upper tract transitional cell cancer after cystectomy varies between 0.75% and 6.4%.[1] Due to the significant anatomical changes, urologists face a considerable challenge when performing retrograde diagnostic ureteroscopy, particularly in locating the ureteral orifice. This often necessitates the use of antegrade kidney puncture and guidewire transition in a "through-n-through" manner.[2] Interventional radiologists possess an advantage in navigating small tracts through blind procedures using contrast and very fine guidewires and microcatheters.[3] In this video, we present a unique approach to retrograde brush cytology for assessing upper tract suspicious lesions following radical cystectomy and urinary diversion.

METHODS

A retrospective analysis was conducted, encompassing cases involving both loopography and retrograde ureteral brush cytology. Clinicodemographic information and detailed procedural specifics were systematically collected, with brush cytology results graded according to "the Paris classification."[4]

The video recording method adhered to a protocol that mandated the acquisition of specialized consent for video recording. Images were captured for research and presentation purposes. Intraoperative videos and fluoroscopy sequences were recorded, while video editing was executed using Windows Movie Maker software. Voiceovers were incorporated using the "Text Magic" software.

RESULTS

Three patients underwent loopography and retrograde brush cytology in the technique described with median age of 61, two cases of right side and one left. Upper, middle and uretero-ileal anastomosis lesion was suspected in each of the three patients. Median procedure time was 46 minutes. Two patients had positive cytology results (one had diagnostic ureteroscopy and later radical nephroureterectomy and one is under workup. The third patient with negative results continued f/u. All procedures were out-patient. **Table 1** describes the patients' path.

Table 1. Patients' Clinicodemographic Parameters and Outcome

	Patient 1	Patient 2	Patient 3
Age	52	78	61
Gender	m	m	m
Location	Upper Ureter	Uretero-ileal Anastomosis	Mid Ureter
Procedure time	46 minutes	16 minutes	52 minutes
Cytology results (PARIS)	Suspicious for HG (4)	Negative (2)	Suspicious for HG (4)
Complications	—	—	—
Follow-up surgery	Due for ureteroscopy	—	Diagnostic ureteroscopy (HG)➔ RNU
Outpatient	v	v	v

DISCUSSION

As a result of significant anatomical changes following cystectomy and urinary diversion, urologists are faced with a challenging diagnostic scenario when performing retrograde diagnostic ureteroscopy. Using fluoroscopic-guided retrograde brush cytology, this video presents a novel approach for evaluating suspicious upper tract lesions in a puncture-free approach. Three cases were safely performed, with two cytology results being positive and one being negative, demonstrating its diagnostic utility.

Interventional radiologists, who are adept at navigating small tracts through blind procedures, play an important role when tracking invisible uretero-ileal anastomosis. These cases illustrate the successful application of the technique, with suspected lesions identified at various anatomical sites and positive cytology results prompting further diagnostic and therapeutic efforts.

Besides streamlining the diagnostic process, this innovative diagnostic approach demonstrates the close collaboration between urologists and interventional radiologists. The video establishes a promising avenue for improving diagnostic accuracy and improving post-cystectomy suspicious lesions less invasive diagnosis.

Confirmatory ureteroscopy should be considered in the majority of cases, especially when the lesion is small and can be treated by endoscopy, or when a suspicious lesion has been revealed to be benign. Looking ahead, a hybrid

approach that combines radiographic guidewire tract and ureteroscopy may offer a promising combination for future procedures.

References

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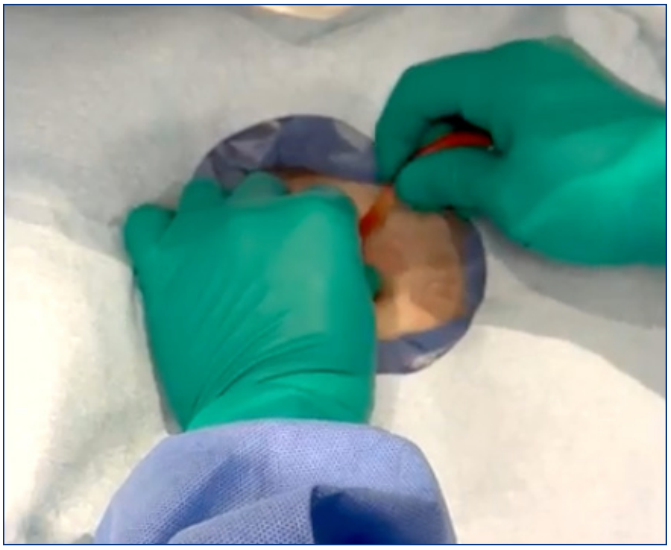
VIDEO TRANSCRIPT

During this video, we will discuss a unique technique for diagnosing a suspicious upper tract lesion after radical cystectomy and ileal conduit urinary diversion

A 51-year-old male was diagnosed with muscle invasive bladder cancer in July 2020. Following neo-adjuvant chemotherapy, he underwent robotic radical cystoprostatectomy. A year later, he was diagnosed with left upper tract urothelial carcinoma and had a left nephroureterectomy.

Video Link

https://drive.google.com/file/d/1AFmCUmvUEqoI7n9YAfbgG-om9lyIe-hSs/view?usp=drive_link



On recent imaging, his single kidney is shown to have an upper ureteral filling defect. Diagnostic right ureteral brush cytology under fluoroscopy was planned.

A 16 French Foley catheter was advanced into the ileal conduit via the patient's urostomy stoma. A small amount of contrast was then injected via the Foley catheter to opacify the ileal conduit. There was prompt reflux of contrast into the right ureter and renal collecting system

A 5 French Kumpe catheter and a Glidewire were then advanced in parallel to the Foley catheter, and the catheter and wire combination used to engage the right ureteral anastomosis.

The wire was then exchanged for a microwire which was advanced in retrograde fashion across the anastomosis and up the ureter to the collecting system under fluoroscopic guidance. A microcatheter was then advanced into place over the wire, with the tip of the catheter advanced to the level the renal pelvis.

Contrast was then injected for the purposes of performing a nephrostogram and ureterogram. No filling defects or obvious abnormalities were noted within the renal collecting system. A filling defect at the level of the upper ureter was observed.

The cytology brush was advanced into place and brushings were obtained at the focal area of mid ureteral narrowing. The sheath was gradually pulled down to the ureteral anastomosis and additional cytology brushings were obtained across the area of the anastomosis.

Urine was then obtained using a syringe through the ureteral catheter

The sheath was then removed over a guidewire. A 10 French single-j ureteral stent was then advanced into place over the wire, with the loop of the catheter positioned at the renal pelvis

The total procedure time was 46 minutes. The patient was discharged home a few hours after the procedure. No complications were observed. The ureteral stent was removed after one week.

Throughout all diagnostic procedures, no percutaneus nephrostomy was required. Cytology result showed positive for high-grade urothelial carcinoma.