Diagnostic assessment of hematuria from the ileal conduit of a patient with a history of radical cystoprostatectomy and nephroureterectomy: a case report

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European Journal of Medical Case Reports
Volume 3(2):74–77

https://doi.org/10.24911/ejmcr/173-1543438037

ABSTRACT

Background: Radical cystoprostatectomy (RC) with ileal conduit reconstruction represents a standard of care procedure for advanced bladder cancer. Patients submitted to RC and urinary diversions are at high risk of developing recurrent tumors or other complications related to the diversion. Lifelong diagnostic follow-up is recommended in these patients.

Case Presentation: We present a case of a patient with a history of RC and nephroureterectomy for upper tract recurrence and who also developed gross hematuria 8 years after his initial treatment. The patient was exposed to several diagnostic steps, including imaging, laboratory, and endoscopic examinations.

Conclusion: Patients with advanced and recurrent urothelial cancer who present with gross hematuria need a stepwise diagnostic approach which is difficult and complicated in many cases.

Keywords: Hematuria, radical cystoprostatectomy, ileal conduit, nephroureterectomy, endoscopy, bladder cancer.

Received: 28 November 2018 **Accepted:** 17 February 2019

Type of Article: CASE REPORT

Funding: None

Declaration of conflicting interests: None

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Background

The widespread of oncologic radical surgeries in Urology, such as radical cystoprostatectomy (RC) with urinary diversion using an ileal loop (Bricker's diversion), can result in several complications that require a specialized diagnostic and therapeutic approach. Patients with high-risk bladder cancer (BCa) may develop complications and recurrences on the upper urinary tract. We present a step-by-step diagnostic assessment in a patient with a history of RC and nephroureterectomy and who presented also with gross hematuria.

Case Presentation

A 66-year-old male with bladder cancer was admitted to our Hospital (Department of Urology-Oncology, "Theageneio" Cancer Hospital of Thessaloniki) to Bricker's RC 8 years ago due to multiple recurrences of T1GII BCa and Bacillus Calmette-Guerin failure. The patient had a history of several transurethral resections for 12 years. Laboratory, clinical, and imaging intensive evaluations were normal 2 years after the cystoprostatectomy with no signs of recurrence.

Three years after the treatment, the patient presented with macroscopic hematuria and was exposed to an extensive diagnostic work-up, including urinary ultrasound, computed tomography (CT), pyelography, and dimercaptosuccinic acid scan which revealed a large right renal tumor and severe deterioration of the right kidney (Figure 1). An open right nephroureterectomy was planned, and the right kidney was removed through a retroperitoneal approach. The last 3–4 cm of the right ureter was not removed because of fibrous tissue present in the area from the previous operation near the anastomosis with the ileal loop. The histopathological report indicated a T2 high-grade papillary transitional cell carcinoma extending from the renal pelvis up to the upper ureter with negative surgical margins.

Two years later, the patient presented again with macroscopic hematuria from the conduit. The imaging evaluation with intravenous pyelography and computed tomography was negative, as well as the urinary cytology. Endoscopic evaluation of the ileal loop was attempted using a rigid and a flexible cystoscope but the localization of the ureteral anastomotic orifices was not possible due to multiple mucosal folds and intestinal mucus of the neo-ileal-bladder. For that reason, the endoscopic assessment was attempted again using a flexible gastroscope under radiological assistance.

Initially, methylene blue was intravenously administered to the patient and then a loop-o-scopy was performed with the flexible gastroscope. The left orifice was spotted ejecting blue urine and hemorrhage observed

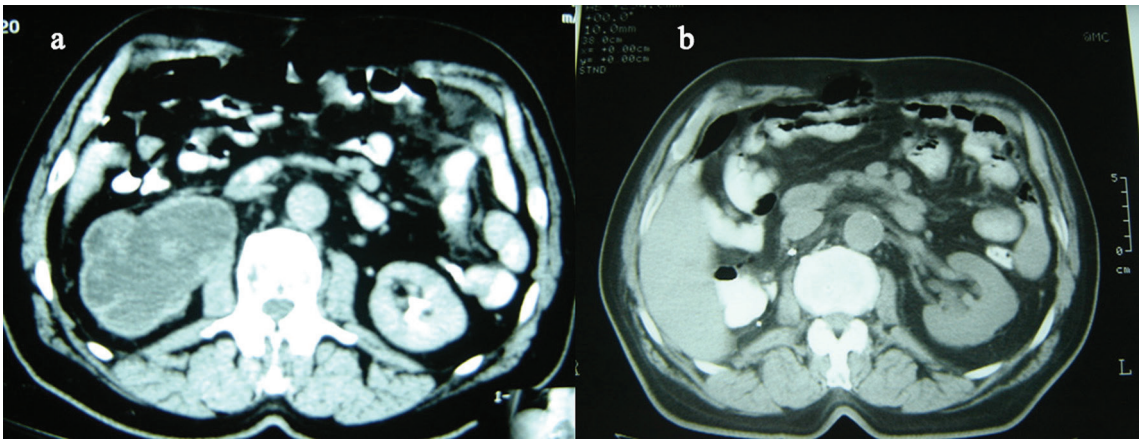

Figure 1. *(a) Computed tomography revealing the large right renal tumor. (b) Post-nephroureterectomy CT evaluation.*

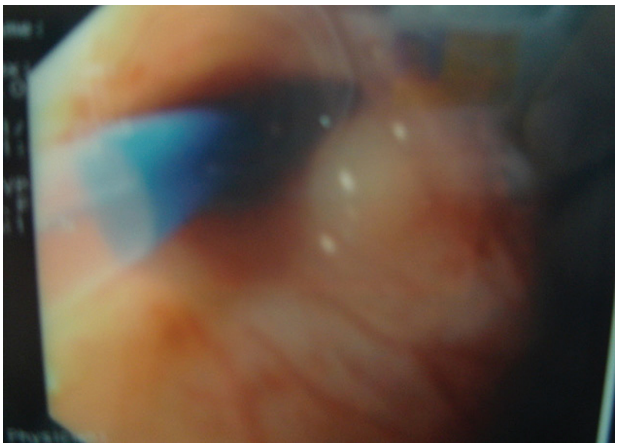

Figure 2. *Endoscopic image using a flexible gastroscope and an ERCP catheter inserted into the left ureteral orifice.*

from the area of the right orifice (Figure 2). Subsequently, using an endoscopic retrograde cholangiopancreatography (ERCP) catheter, a retrograde pyelography of the left upper tract was performed demonstrating normal findings (Figure 3) and then contrast was injected into the right ureteral stump that did not show any filling defects. Finally, loop washing was performed in order to remove any blood clots and ureteral tissue was obtained using a brush, for cytological evaluation. Nevertheless, the cytology examination was negative for cancer cells and the hemorrhage was attributed to local inflammation of the right ureteral stump. Eventually, spontaneous suspension of the hematuria occurred without any intervention.

Discussion

There are several complications of urinary diversion and neo-bladder reconstruction that include gastrointestinal complications (paralytic ileus, small bowel obstruction, colitis, and anastomotic bowel leak) 30%, infectious complications (30%), wound complications (21%), genitourinary complications (ureteral obstruction, urinary leak,

Figure 3. *Retrograde uretero-pyelography of the left (normal) kidney through the catheterized ureteric orifice.*

loop necrosis, and lithiasis) 17%, venous thromboembolism up to 8%, other surgical (rectal injury and hernias) 1%, and overall mortality 3%–9% within 90 days of surgery [1]. Moreover, there are some frequent metabolic complications such as vitamin B12 deficiency, metabolic acidosis, and renal function deficiency. All these complications can be detected in 45% of patients during the first 5 years of follow-up; thus, long-term evaluation of at least 15 years is recommended.

Additionally, patients submitted to radical cystectomy are at high risk of developing recurrent transitional

tumors even in the late years of follow-up. It is estimated that 1.8%–6.0% of cases will develop upper tract urothelial carcinoma (UTUC) during their follow-up [2], with non-muscle invasive bladder cancer increasing this risk twice, multifocality thrice, and positive margins by seven-fold [3]. The time needed for UTUC after BCa to occur ranges from 7 to 20 years. Urinary cytology has 56.3% of sensitivity and 98.8% of specificity in detecting recurrent UTUC after cystoprostatectomy in asymptomatic patients. It is highly recommended to routinely perform urinary cytology due to its positive predictive value [4]. Symptomatic patients presenting mainly with gross hematuria must be carefully evaluated. Several international protocols have been suggested for follow-up in these patients, including blood tests, urine cultures, cytology, chest X-ray, Ultrasound, bone scans, and CT urography that demonstrate a survival benefit in the early detection of recurrence in asymptomatic patients [5].

Apart from UTUC recurrence after RC, patients with urinary diversion have a higher risk of developing intestinal tumors compared to the general population due to the carcinogenetic effect of urine in intestine mucosa theory. These secondary tumors include mainly adenocarcinomas, squamous cell carcinomas, and anaplastic carcinomas [6]. In the past, when ureterosigmoidostomy was predominately used for diversion, this risk was extremely higher [7]. However, secondary tumors of the ileal loop or neo-bladder must be frequently screened and suspected in cases of hematuria.

Finally, regarding the remaining ureteral stump, it is known that 30% of the cases with UTUC submitted to nephrectomy sparing the distal ureter will develop TCC recurrence in the stump. Therefore, these patients require an endoscopic and/or radiologic evaluation of the stump [8].

In our case, despite the stepwise diagnostic workup which includes a series of endoscopic examinations, radiologic evaluation, and cytologic tests, no malignant pathology was demonstrated and the hematuria was attributed to a benign lesion of the ureteral stump. However, the patient is still under close follow-up.

Conclusion

Gross hematuria in patients with urinary diversion after RC is an alert for disease recurrence. Complete diagnostic work-up must be performed in all patients regardless of the presence of symptoms or not. In our case, the methodical diagnostic approach temporarily excluded any malignant pathology.

Acknowledgments

None.

List of Abbreviations

RC	Radical cystoprostatectomy
BCa	Bladder cancer
ERCP	Endoscopic retrograde cholangiopancreatography
UTUC	Upper tract urothelial carcinoma

Consent for publication

Written informed consent was obtained from the patient

Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

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Summary of the case

Patient (gender, age)	1	Male, 66
Final diagnosis	2	Spontaneous suspension of the hematuria with no proof of recurrence
Symptoms	3	Hematuria
Medications	4	None
Clinical procedure	5	Advanced diagnostic work-up, including imaging, cytology, and endoscopic examinations
Specialty	6	Urology, Pathology