Endoluminal Metastasis of Colon Cancer to the Urinary Bladder via the Ureter: Report of a Case

ANDREA GIULIANI1, GASPER GALATI1, MARTINO DEMORO1, MICHELE SCIMÒ1, ANTONIO CIARDI2, and LUIGI BASSO1

1Department of Surgery “Pietro Valdoni”, University of Rome “Sapienza” 1st Medical School, Policlinico “Umberto I”, viale del Policlinico 155, 00161 Rome, Italy
2Department of Experimental Medicine and Pathology, Policlinico “Umberto I”, Rome, Italy

Abstract
A 67-year-old woman was admitted for intermittent gross hematuria. Her medical history included a right colectomy for cancer of the ascending colon and removal of metastatic nodes adjacent to the right internal iliac vessels, respectively at 63 and 65 years of age. Cystoscopy detected a semi-pedunculated, nonpapillary (3.5–4 cm diameter) tumor situated above the right ureteral orifice. The histological evaluation of the resected specimen revealed metastatic colonic adenocarcinoma. The history and pathological findings were consistent with a mechanism of endoluminal implantation of adenocarcinoma of the large bowel to the bladder via the right ureter.

Key words Endoluminal · Metastasis · Colon · Cancer · Urinary · Bladder · Ureter

Introduction
The urinary bladder may be directly invaded by tumors of the rectum, prostate, and female genital tract,1–3 while metastases from adjacent or distant organs, via the hematic or lymphatic stream, are rare.4–7 Endoluminal secondary tumors that metastasize via the ureter are anecdotal and have never been reported in the English language literature.8 Any adenocarcinoma of the bladder should raise the suspicion of a distant primary cancer, and the histological similarity between primary bladder adenocarcinoma and metastatic colorectal adenocarcinoma can be challenging for the pathologist.9 This report presents a case of endoluminal implantation of adenocarcinoma of the large bowel to the bladder via the right ureter.

Case Report
A 63-year-old woman was admitted in January 2003, following intermittent episodes of constipation and an endoscopic diagnosis of cancer of the ascending colon. Computed tomography (CT) ascertained the local extent of the tumor, and a radical right hemicolectomy was performed. The histology showed a poorly differentiated mucin-producing adenocarcinoma, pT3 pN1 pM0; Grade 3 stage IIIB.10 Systemic adjuvant chemotherapy (FOLFOX4 regimen, consisting of oxaliplatin, leucovorin, and 5-fluorouracil) was administered after surgery. Both carcinoembryonic antigen and carbohydrate antigen 19-9 were significantly elevated 23 months after surgery, and a 3-cm lesion in the right iliac fossa, proximal to the mass, with hydronephrosis and hydroureter, was diagnosed by magnetic resonance imaging (MRI). A double-J stent was placed in the right ureter percutaneously, prior to open surgery. In January 2005, a laparotomy was performed to remove a mass attached to the nodes adjacent to the right ureter and internal iliac vessels. The histological examination showed extensive areas of tumor cell growth, with features similar to the previous colon cancer. Postoperative treatment included a combination of systemic induction chemotherapy (FOLFIRI regimen, consisting of folinic acid/leucovorin, fluorouracil, and irinotecan), followed by radiotherapy, delivered to the right pelvis (total dose: 30 Gy) over a period of 6 months. The patient subsequently recovered, except for irregular episodes of gross hematuria, which were initially considered to be related to the ureteral stent and radiotherapy. In March 2007, a cystoscopy revealed a semi-pedunculated, non-papillary, white-gray mass with focal hemorrhagic areas, grossly spherical in shape, 3.5–4 cm in diameter, arising from the urothelium above the right ureteral orifice. No biopsy was performed because of the friability of the lesion. The preoperative ultrasonography and CT scan demonstrated that the lesion was limited to the bladder...
A transurethral resection of the neoplastic tissue and of its base was performed subsequently. The histology showed tubular and pseudoglandular structures, intermixed with a solid foci of mucin producing signet-ring cell type adenocarcinoma, partially covered by an intact urothelium (Fig. 2). The malignant cells were very similar to the original colon cancer, and showed staining positive for cytokeratin-20 (CK20) and negative for cytokeratin-7 (CK7). The base of the tumor was disease-free. The postoperative course was uneventful and the patient is doing well, with no signs of recurrence, at 24 months after the surgical cystoscopy.

**Discussion**

Secondary involvement of the urinary bladder may occur by direct spreading, by means of hematogenous/lymphatic spread, or by reimplantation of cells exfoliated from tumors higher up in the urinary tract. Cancers of the prostate, ovary, cervix and uterus, rectum, and sigmoid colon infiltrating the bladder are common.1,2

**Fig. 1.** A Ultrasonography, showing a hyperechoic mass arising from the right bladder wall. B Computed tomography, showing a mass of the right bladder wall and a stent in the right ureter

**Fig. 2A,B.** Histological and immunohistochemical images of the bladder lesion. A Suburothelial neoplastic proliferation made of glandular lumens and solid nests (H&E, ×250). B Numerous neoplastic cells show positive staining for cytokeratin-20 (PAP-DAB, ×250). C Immunostaining for cytokeratin-7 shows positive staining in the urothelium, whereas the neoplastic cells are diffusely negative (PAP-DAB, ×250)