Clinical Case Report

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Failure of 3 different methods and biopsy sites to diagnose a patient with invasive colorectal cancer

A case report

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Abstract

Rationale: Colorectal cancer is one of the most commonly diagnosed cancers worldwide, and the majority arise from neoplastic adenomatous polyps. Bladder involvement in colorectal cancer is uncommon and found in approximately 3% of the cases, most commonly in sigmoid and rectal tumors and the diagnosis is classically based on biopsies of affected tissues.

Patient concerns: A 68-year-old male with no significant past medical history underwent diagnostic colonoscopy for abdominal distension and constipation with positive fecal occult blood test ordered by the primary care physician.

Diagnosis: Colonoscopy showed a sigmoid mass with biopsy finding of tubulovillous adenoma. Laparoscopy was performed for sigmoid colonic resection, but as the mass was large, a diverting loop colostomy and multiple biopsies were performed revealing tubulovillous adenoma again. Postoperative workup revealed right hydronephrosis, and cystoscopy was performed confirming bladder wall invasion with biopsies showing benign bladder wall tissue with no evidence of dysplasia or malignancy. Furthermore, computed tomography (CT)-guided core-needle biopsies of the colonic mass were performed but revealed adenomatous colonic mucosa without evidence of carcinoma.

Intervention: Definitive surgical *en bloc* excision of the tumor and anterior bladder wall was performed with urology team until grossly free margins were attained. Final pathology revealed well-differentiated mucinous adenocarcinoma arising from a preexisting tubulovillous adenoma with direct invasion of the bladder wall.

Outcomes: The patient's postoperative recovery was uneventful, and he was discharged 2 weeks postoperatively with planned adjuvant chemotherapy.

Lessons: This case represents a classical presentation of invasive colorectal cancer. Perioperative workup, however, was confounded by failure of open, cystoscopic, and CT-guided biopsies to establish a tissue diagnosis for directed therapy. Upon literature review, evidence exists to support our approach to this unique dilemma.

Abbreviations: cm = centimeters, CT = computerized tomography, pT4 = American Joint Committee on Cancer classification where tumor invades through the visceral peritoneum or invades other organs/structures in pathological study.

Keywords: biopsy, case report, colorectal neoplasms, differential diagnosis, surgical pathology

1. Introduction

Colorectal cancer is one of the most commonly diagnosed cancers worldwide with marked geographic differences in incidence. Despite its high incidence, mortality has decreased in many countries since 1990.[1] This improving mortality rate is closely related with increasing populational screening,[2] and therefore only up to 10% of cases present as invasive colorectal carcinoma (AJCC stage pT4).[3]

The most common diagnostic test for colorectal carcinoma is tissue biopsy during colonoscopy and its sensitivity has been reported to be as high as 87%.[4] In invasive colorectal carcinoma cases, preoperative diagnosis by pelvic CT scan or magnetic resonance imaging is often limited due to difficulty in distinguishing between invasive disease and local inflammation.[5]

In this report, we discuss the importance of clinical suspicion for colorectal cancer diagnosis even with multiple negative biopsies from different sites and how *en bloc* excision of tumoral mass was seminal for diagnosis and initial treatment of this case.[6]

2. Case report

A 68-year-old Hispanic male with no significant past medical history underwent diagnostic colonoscopy for abdominal distension and constipation with positive fecal occult blood. During colonoscopy he was found to have a sigmoid mass, and he

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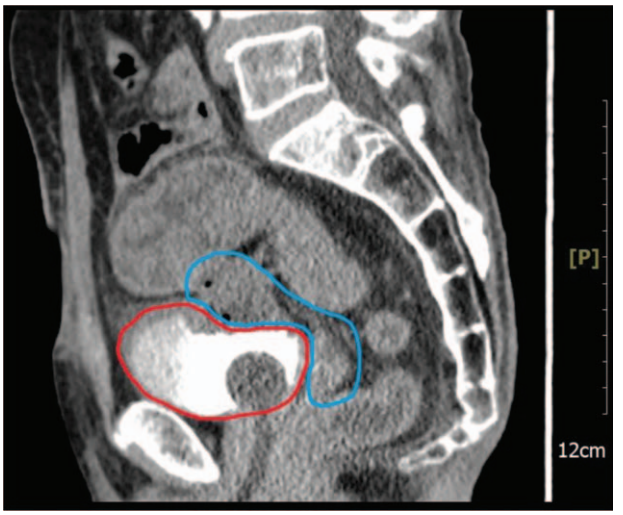

Figure 1. Sagittal abdominal computed tomography scan showing the tumoral mass (blue) adjacent to the rectosigmoid colon and urinary bladder (red).

presented to our general surgery office for colonoscopy biopsy findings of tubulovillous adenoma with focal high-grade dysplasia. During diagnostic laparoscopy for planned sigmoid colonic resection, a large $10 \times 10 \times 15$ cm sigmoid colonic mass was discovered and noted to be fixed in the pelvis and invading the bladder wall. Due to the size of the mass and indeterminate diagnosis, a diverting loop colostomy was performed for obstructive symptoms, and multiple biopsies were performed. Surgical pathology revealed tubulovillous adenoma and benign tubular adenomas. Furthermore, postoperative workup revealed right hydronephrosis, and cystoscopy performed 3 days postoperatively confirmed bladder wall invasion; bilateral ureteral stents were placed, and biopsies of the bladder were performed. Pathology revealed benign bladder wall tissue with no evidence of dysplasia or malignancy. Computed tomography (CT)-guided core-needle biopsies were subsequently performed to establish the diagnosis and direct therapy (Figs. 1 and 2). Pathology from these biopsies revealed adenomatous colonic mucosa without evidence of carcinoma. Finally, definitive surgical resection was performed 2 months after initial colonoscopy to excise the obstructing tumor and establish a definitive diagnosis. An *en bloc* excision of the

Figure 2. Axial abdominal computed scan showing the core biopsy needle inside the tumoral mass.

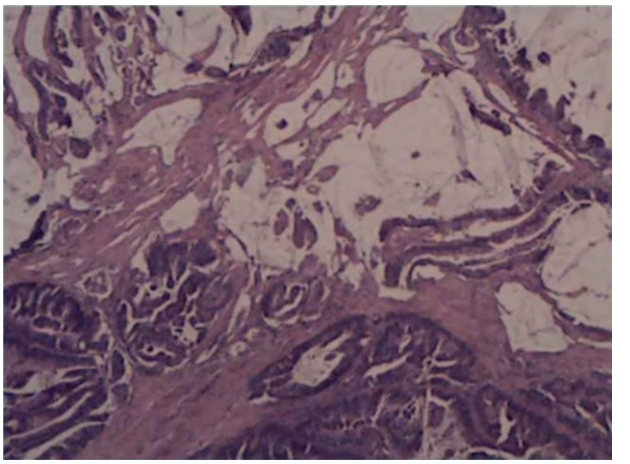

Figure 3. Pathology slide showing well-differentiated mucinous adenocarcinoma arising from a tubulovillous adenoma.

tumor and anterior bladder wall was performed with urology until grossly free margins were attained; the previous colostomy was left in place, the bladder wall was repaired primarily with ureteral stents left in place, and approximately 10 cm of intraabdominal large bowel remained distally. Final pathology revealed well-differentiated mucinous adenocarcinoma arising from a preexisting tubulovillous adenoma with direct invasion of the bladder wall and histological free margins in the resected tumor (Figs. 3 and 4). The patient's postoperative recovery was uneventful, and he was discharged 2 weeks postoperatively with planned adjuvant chemotherapy.

3. Discussion

Most colorectal cancers arise from neoplastic adenomatous polyps in a long-term carcinogenic process involving damage to proto-oncogenes and tumor suppressor genes.[7] Sporadic nonhereditary colorectal cancer is the most common type.[8] Despite the majority of colorectal cancer being located in the left colon and rectum, an increasing incidence of right-sided colon

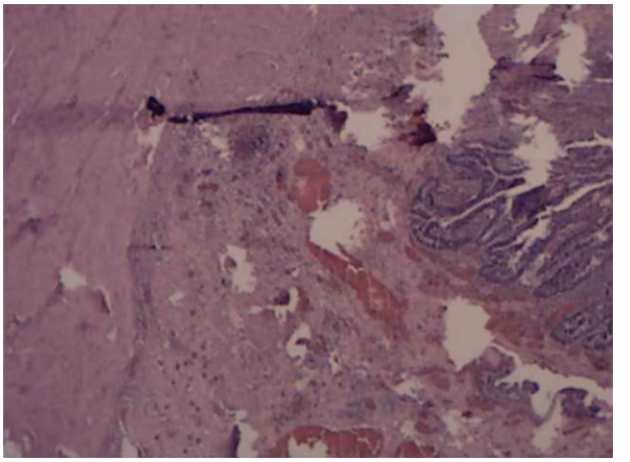

Figure 4. Pathology slide showing bladder wall with colonic adenocarcinoma tumor deposits.

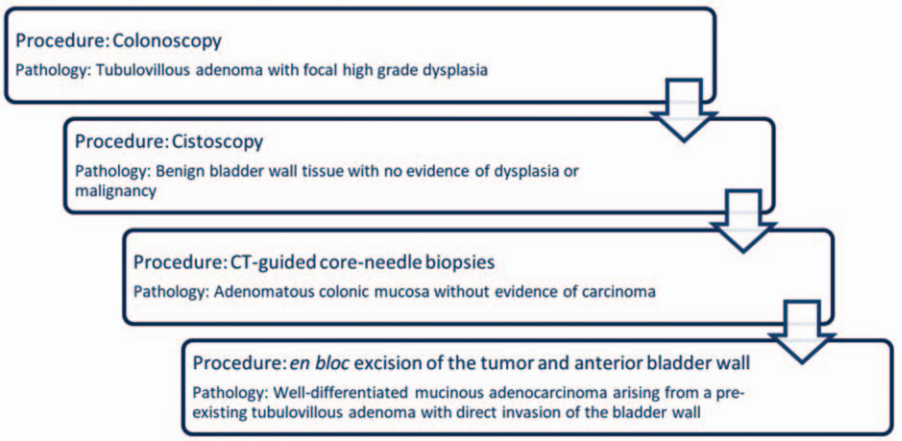

Figure 5. Timeline of the tests performed with pathology results.

cancer has been reported.[9] Approximately 10% of patients with colorectal cancer present with tumors with direct invasion or adherence of other organs.[10] Bladder involvement in colorectal cancer is uncommon and found in approximately 3% of the cases, most commonly in sigmoid and rectal tumors.[11] Cystoscopy has been reported to have a similar sensitivity to pelvic CT scan for identifying local bladder invasion, but may be a useful tool for surgical planning.[12] The uniqueness of this case is not only the tumoral bladder involvement, but also 3 consecutive negative biopsies done by different methods: open, cystoscopic, and CT guided (Fig. 5).

In cases of colorectal cancer with multivisceral disease, recommendations exist for *en bloc* resection due to favorable outcomes in margin negative tumors. Partial cystectomy in colorectal cancer with urinary bladder invasion has been shown to have similar survival rates with less morbidity compared with radical cystectomy in several case series.[12] According to multiple studies, the 5-year survival rate of stage pT4 colon cancer treated with *en bloc* resection is around 50% with a local recurrence rate of <20%. Prognosis is directly affected by liver metastasis, lymph node invasion, positive resection margin, and the absence of microsatellite instability.[13]

In our case, failure of 3 separate biopsy techniques to establish a tissue diagnosis of invasive adenocarcinoma precluded the use of neoadjuvant chemotherapy, thereby rendering *en bloc* resection to be the treatment of choice. Had a tissue diagnosis of colonic adenocarcinoma been established, neoadjuvant chemotherapy would have been pursued in accordance with the National Comprehensive Cancer Network guidelines.

Sensitivity of tissue biopsy for colorectal carcinoma during colonoscopy has been reported to be as high as 87%,[4] but there is still possibility of missed diagnosis. As any clinical test there is an intrinsic failure rate which is estimated from 0.5 to 3.5 missed colorectal cancer cases per 1000 screening colonoscopies and commonly associated with missed lesions, incomplete resections, incomplete colonoscopy or inadequate bowel preparation.[14] For those unfortunate enough to have a patient with similar inconclusive biopsy results, we hope our case may serve as an evidence for *en bloc* resection with grossly negative margins to achieve oncologically acceptable results.

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Author contributions

DDK was responsible for writing (review and editing), formal analysis, and investigation; KJL was responsible for writing (review and editing), methodology, formal analysis, and supervision; TJL was responsible for writing (original draft), investigation, and data curation; MMM was responsible for conceptualization, supervision, and formal analysis.

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