



Bilateral Metachronous Colon Cancer Metastasis to Kidneys: A Rare Case with a Treatment Dilemma

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ABSTRACT

Colorectal cancer continues to remain one of the most common and lethal cancers, with well-established locations for metastases to the liver, lung, and peritoneum. Improved chemotherapy regimens have resulted in patients with advanced disease experiencing prolonged survival resulting in these patients experiencing new atypical locations for metastases. We report the first case of primary colorectal carcinoma metachronously metastasizing to the kidneys bilaterally in a patient who presented with stage II colorectal cancer 8 years prior to kidney metastasis. The appropriate management of patients with renal lesions in the setting of advanced systemic disease may be challenging. Treatment should be based on preventing dialysis dependence during palliative therapy, performing potentially curative surgery in the setting of decreased systemic disease after neoadjuvant chemotherapy, and providing options for palliative intervention for the symptomatic patient.

INTRODUCTION

Colorectal cancer is the third most common cancer in the United States, with more than 1.5 million new cases and nearly 600 000 projected deaths in 2012 [1]. In general, colorectal cancer most commonly metastasizes to the lungs, peritoneum, and liver; metastases to the kidneys from a primary colorectal adenocarcinoma are rare. In a study of 11 300 autopsies for malignant disease, only 2.8% of kidney metastases arose from a primary colon tumor [2], and to date there have only been 12 non-autopsy cases of renal pelvic or renal parenchymal colon metastasis reported in the literature [3-14]. We present the first case of bilateral metachronous metastases to the kidneys from a primary colon adenocarcinoma.

CASE REPORT

In 2002, a 55-year-old African American female underwent a left hemicolectomy via an open approach for stage IIA (T3N0M0) colon cancer followed by 6 weeks of adjuvant chemotherapy (5-Fluorouracil [5-FU] and leucovorin). Her medical history was significant for COPD and industrial exposure to dyes

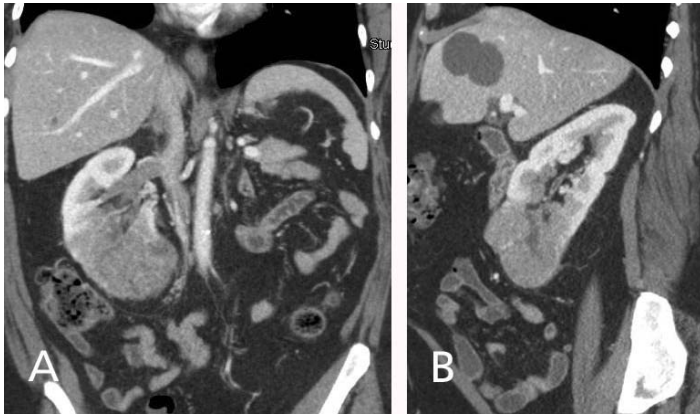
and formaldehyde. After a disease-free interval of 6 years, a positron emission tomography (PET)-computed tomography (CT) found a 4 cm macrolobulated mass in the upper lobe of her right lung. Subsequent CT-guided biopsy confirmed this mass as metastatic colon adenocarcinoma, and she was treated with a second chemotherapy regimen of irinotecan and oxaliplatin. A PET-CT 1 year later was negative; however, a subsequent PET-CT in 2010 showed a new 2 cm mass in the middle lobe of her right lung (CT-guided biopsy confirmed metastatic colonic adenocarcinoma), in addition to a 6 cm heterogenous enhancing mass in the left kidney. She subsequently underwent a left nephrectomy at another institution, confirming metastatic colonic adenocarcinoma and was started on a third chemotherapy regimen consisting of cetuximab, bevacizumab, and irinotecan. More recently, a surveillance CT-scan found a new 8 mm mass in the upper lobe of the right lung and a 3.8 cm x 4.3 cm nodular, heterogeneously enhancing mass in the lower pole of her right kidney. Subsequent biopsy confirmed the kidney mass as metastatic adenocarcinoma and CT scan 3 months later demonstrated that the mass had enlarged to 6.9 cm x 4.5 cm (Figure 1a, Figure 1b). At the present time the patient has elected for further chemotherapy, with the option for palliative invasive therapy if the tumor becomes symptomatic.

KEYWORDS: Colon cancer, renal metastasis, nephron-sparing surgery

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Figure 1. (a) Coronal and (b) sagittal computed tomography of a 6.9 cm x 4.5 cm mass in the lower pole of the right kidney (metastatic colon adenocarcinoma).



DISCUSSION

Colorectal cancer continues to remain one of the most common and lethal cancers in the US with well-established locations for metastases (lung, liver, etc.) [1]. Improved treatment regimens, in particular chemotherapy, including the use of oxaliplatin, have resulted in patients with advanced disease experiencing prolonged survival [15]. As a result, patients may experience new atypical locations for metastases. For example, the current case represents the first reported in the literature of metachronous metastases of colorectal cancer to the kidneys and the thirteenth case overall of metastasis to the kidney (Table 1). Among these cases, the mean age at diagnosis of colon cancer was 62 ± 12 years (median: 56 years) and the mean interval between diagnosis of colon cancer and the discovery of kidney metastases was 42 ± 35 months (median: 33 months). Furthermore, the average life expectancy after the diagnosis of a kidney tumor was only 7 ± 3 months (median: 8 months).

The treatment of kidney lesions for metastasis of colorectal cancer is ill defined. A radical or partial nephrectomy provides the only definitive curative option, while at the same time it provides an accurate pathologic diagnosis of the tumor [3]. Other potential indications for surgery may include tumors that are a threat to patients with concomitant perirenal hematomas and may rupture [4]. Radical nephrectomy eliminates the possibility of hematogenous seeding of tumor cells to distant organs from the kidney, and it has the benefit of providing symptomatic relief during the palliative treatment of metastatic disease [5].

In the setting of metastatic colorectal carcinoma, the argument against surgical management of a renal lesion includes

morbidity accompanying a radical or partial nephrectomy [16] and the potential delay of further chemotherapy during the recovery period [6]. These patients may be candidates for palliative therapy, of which Milbank et al. [7] advocate percutaneous resection of a renal pelvic tumor as a less-invasive surgical alternative (particularly for solitary, low-grade tumors). Since percutaneous resection is less morbid and offers a shorter recovery interval than a nephroureterectomy for renal pelvic tumors or radical/partial nephrectomy for renal parenchymal tumors, presumably patients may be candidates to resume chemotherapy more expeditiously than after invasive surgery. Additional minimally invasive treatment modalities include angioinfarction, cryoablation, or radiofrequency ablation of parenchymal lesions or nephrostomy drainage for obstructing lesions [7].

In light of a dismal prognosis for patients with colorectal metastasis to the kidneys (in addition to other systemic evidence of metastasis), treatment of the kidney lesion should be selected with the following objectives in mind: 1. Prevent the patient from becoming dialysis dependent during palliative treatment; 2. Perform a potentially curative surgery in the setting of decreased systemic disease after neoadjuvant chemotherapy; and 3. Provide options for palliative intervention for the symptomatic patient. As medical management for advanced stages of cancer continues to improve and prolong survival, treatment dilemmas for atypical patterns of metastatic spread will continue to emerge, necessitating dialogue regarding optimal treatment algorithms for these patients.

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Table 1. Thirteen cases of metastatic colorectal adenocarcinoma to the kidneys.

Reference	Age at Diagnosis of CRC (years)	Therapy	Duration of Metastatic CRC at the Diagnosis of Kidney Tumor (months)	Procedure for Kidney Tumor	Subsequent Therapy	Patient Status	Survival After Diagnosis of Kidney Tumor or Nephrectomy
present case	55	5-FU and FA followed by irinotecan and oxaliplatin	left kidney, 96	nephrectomy	cetuximab, irinotecan, bevacizumab	AWD	117
			right kidney, 111	none	TBD	AWD	6
Melichar et al. [8] (2010)	49	HAI FOLFIRI	23	Biopsy	FOLFOX	DOD	9
Komeya et al. [9] (2009)	56	NR	0	nephrectomy	NR	NR	NR
Ho et al. [10] (2009)	84	unspecified	NR	partial nephrectomy	NR	NR	NR
Brambilla et al. [11] (2007)	52	5-FU and FA	18	nephrectomy	FOLFOX	NED	2
Kibar et al. [5] (2005)	54	cisplatin and radiotherapy	26	nephrectomy	patient refused	DOD	7
Waleczek et al. [3] (2005)	77	5-FU and FA	40	partial nephrectomy	patient refused	NR	NR
Milbank et al. [7] (2004)	72	unspecified	48	percutaneous resection	none	DOD	NR
Julianov et al. [12] (2004)	58	5-FU and FA	60	nephrectomy	FOLFIRI	AWD	12
Aksu et al. [6] (2003)	NR	not applicable	0	nephrectomy	5-FU and FA, subsequently capecitabine	DOD	9
Wolff et al. [4] (1994)	NR	NR	NR	nephrectomy	NR	NR	NR
Lowe et al. [13] (1992)	68	unspecified	24	percutaneous resection	NR	NR	NR
Shiraishi et al. [14] (1989)	55	NR	62	none, confirmed at autopsy	5-FU	DOD	2

CRC: colorectal cancer; DOD: died of disease; FOLFIRI: leucovorin, 5-fluorouracil, irinotecan; FOLFOX: leucovorin, 5-fluorouracil, oxaliplatin; HAI: hepatic arterial infusion; NR: not reported; AWD: alive with disease; NED: no evidence of disease; TBD: to be determined; FA: leucovorin

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