CASE REPORT

Salvage paclitaxel chemotherapy for metastatic collecting duct carcinoma of the kidney

Aditya Bagrodia, MD,[1] Robert Gold, MD,[1,2] Charles Handorf, MD,[1,3] Andrew Liman, MD,[4] Ithaar H. Derweesh, MD[1]

[1]Department of Urology, University of Tennessee Health Sciences Center, Memphis, Tennessee, USA
[2]Department of Radiology, University of Tennessee Health Sciences Center, Memphis, Tennessee, USA
[3]Department of Pathology, University of Tennessee Health Sciences Center, Memphis, Tennessee, USA
[4]University of Tennessee Cancer Institute, University of Tennessee Health Sciences Center, Memphis, Tennessee, USA

BAGRODIA A, GOLD R, HANDORF C, LIMAN A, DERWEESH IH. Salvage paclitaxel chemotherapy for metastatic collecting duct carcinoma of the kidney. The Canadian Journal of Urology. 2008;15(6):4425-4427.

We report a case of metastatic collecting duct carcinoma (CDC) incidentally found on computer assisted tomography in an 18-year-old male who presented status post a motor vehicle crash (MVC). The patient underwent total nephrectomy/renal vein thrombectomy with retroperitoneal lymph node dissection, followed by multimodal therapy, with gemcitabine and platinum salt therapy, effecting a short lived complete response, followed by single agent paclitaxel chemotherapy effecting a similarly short lived partial response. We conclude that cytoreductive nephrectomy and lymphadenectomy combined with chemotherapy may be useful for extending and increasing the quality of life of selected patients with CDC.

Key Words: collecting duct carcinoma, Bellini duct carcinoma, renal cell carcinoma, paclitaxel, chemotherapy, nephrectomy, lymphadenectomy

Introduction

Collecting duct carcinoma (CDC) is a rare, aggressive form of renal cancer that is associated with poor prognosis and tends to affect younger patients.[1] A relationship between sickle cell trait and CDC has been noted in several studies, which is also the case in our report.[2] First described in 1976, CDC tends to originate in the renal medulla, have a tubulopapillary structure, and often demonstrates desmoplasia.[1] CT imaging commonly demonstrates preservation of the outer renal contour with protrusion of the mass into the central sinus.[3]

Accepted for publication September 2008

Address correspondence to Dr. Ithaar H. Derweesh, Department of Urology, University of Tennessee Health Sciences Center, 910 Madison Avenue, Room 412, Memphis, TN 38163 USA

Case report

An 18-year-old male presented with facial trauma and abdominal and extremity pain after an MVC. He had sickle cell trait, and no family history of genitourinary (GU) malignancy. Physical exam revealed multiple facial lacerations, orthopedic injuries, and diffuse abdominal tenderness. Urinalysis was negative for hematuria and a serum creatinine was 1.1 mg/dl. CT (computed tomography) scan demonstrated a right irregular lower pole renal lesion, 5 cm in greatest dimension, with a differential diagnosis of mass versus renal laceration. Six weeks later, the patient

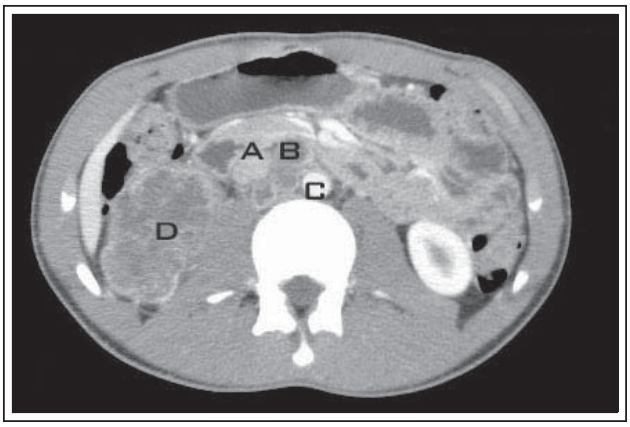

Figure 1. Preoperative computed tomography scan with intravenous contrast. A= inferior vena cava; B = periaortic lymphadenopathy; C = aorta; D = right lower pole mass.

underwent repeat CT, which demonstrated an interval increase in maximal dimension to 6.5 cm with a 1 cm pulmonary nodule and periaortic lymphadenopathy, Figure 1. Percutaneous biopsy of the renal mass was consistent with CDC, Figure 2, positive for cytokeratin, ulex europeus antigen, peanut agglutinin , cytokeratin 7 (CK7), epithelial membrane antigen (EMA), focally positive for cytokeratin 20 (CK20), negative for thyroid transcription factor-1 (TTF-1), vimentin, and placental alkaline phosphatase (PLAP). Positron emission tomographic (PET) scan revealed increased intensity in lung fields, supraclavicular and retroperitoneal nodes, the L3 vertebra, and the right kidney.

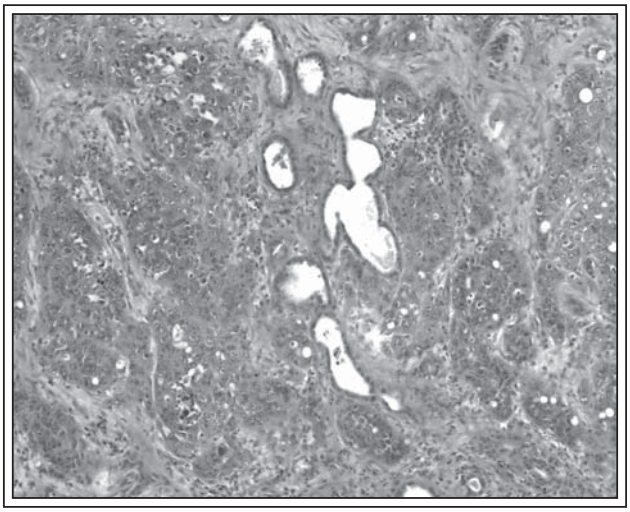

Figure 2. Hematoxylin and eosin stain of tumor magnified 200x. Tubular dysplasia and desmoplastic features of collecting duct carcinoma.

The patient underwent a right nephrectomy/renal vein thrombectomy with retroperitoneal lymph node dissection, with consequent resolution of his abdominal discomfort. Grossly the right renal mass measured 8 cm x 7 cm x 5 cm, with extension into the perinephric tissues, renal pelvis, and renal vein with three positive lymph nodes (pathological stage T3bN2M1). One month postoperative, the patient began chemotherapy consisting of six cycles of gemcitabine (1000 mg/m^2) and cisplatin (60 mg/m^2). Six months postoperative CT scan demonstrated complete response with no abdominal or pelvic masses, and resolution of the pulmonary metastasis. Eleven months after the nephrectomy the patient presented with fever and nausea/vomiting. CT showed bilateral pleural effusions, liver metastases and multiple spinal and pelvic bony lesions.

The patient was then started on three cycles of single agent paclitaxel (225 mg/m^2, every 21 days). At 15 months postoperatively, CT showed findings consistent with a partial response, with resolution of pleural effusions, improvement in hepatic metastastic load greater than 50%, and resolution of the patients' jaundice and pruritus. Follow-up CT at 19 months postoperative showed disease progression, upon which patient began hospice care, expiring 22 months postoperatively.

Discussion

CDC is postulated to be closely associated with urothelial cell carcinoma (UCC), reflecting the common embryologic origin from the mesonephric duct.[3] Milowsky et al point out that histologically both CDC and UCC often have papillary components and tubular dysplasia, along with a similar immunohistochemical profile (ulex europeus, peanut agglutinin, and high molecular weight keratin positivity).[4] Contemporary therapy for CDC is guided by commonalities with respect to the embryology and tumor biology of CDC and UCC.[2,5] Recently, the largest prospective trial for cisplatin/gemcitabine in the treatment of CDC was published.[6] This study showed an objective response rate (complete response + partial response) of 26%, with patients having a median overall survival of 10.5 months. Paclitaxel/carboplatin with nephrectomy provided one patient with extended disease free survival in a single patient report.[7] Paclitaxel is postulated to be effective for UCC and CDC, as opposed to clear cell renal carcinoma, since Bellini duct and transitional cells do not express high amounts of multidrug resistance protein (MDR).[7] On the other hand, CDC tends to be resistant to radiotherapy, with no reports of any marked responses.[8]

Based on prospective randomized trial data, cytoreductive nephrectomy prior to systemic therapy for metastatic clear cell renal cell carcinoma has been shown to result in a survival benefit.[9] On the other hand, the role of cytoreductive nephrectomy prior to systemic therapy has not been well studied in other histological subtypes. In particular, role of nephrectomy in treating patients with metastatic CDC has been challenged by Mejean et al, who found a median survival of 6 months in patients with metastatic CDC who underwent nephrectomy and carried a postoperative mortality rate of 30%.[10] However, the median age of the ten patients evaluated in the study was 66.2 years. On the other hand, better performance status has been shown to be a predictive factor for improved outcomes for multi-modality therapy for metastatic renal cell carcinoma and in this case, the patient's younger age, lack of comorbidities, and better general medical condition at presentation were factors warranting the consideration of cytoreductive nephrectomy followed by adjuvant therapy.[11] In such selected cases, we also urge consideration for debulking of retroperitoneal lymphadenopathy both for palliative as well as for therapeutic purposes, given the resolution of the patient's abdominal symptoms as well as the subsequent response to further therapy.

Our case is the first reported case in the literature demonstrating a response to salvage paclitaxel therapy after failure of gemcitabine-platinum chemotherapy after cytoreductive nephrectomy. Our patient's overall survival of 22 months is significantly higher than most median survivals reported for metastatic disease in the literature.[1,6,9] Consideration should be given to the role of salvage taxol based regimens, as well as to the role of nephrectomy with retroperitoneal lymphadenectomy as a primary cytoreductive (as well as palliative) adjunct as part of a multi-modality approach to this disease.

In summary, CDC is an aggressive disease that is often metastatic at presentation, and should particularly be considered in sickle cell trait patients that are found to have a renal mass. In this case, nephrectomy was beneficial for symptomatic palliation and may have had a cytoreductive role in facilitating tumor response to multi-modality therapy. More research is needed on paclitaxel therapy, which showed favorable response in our case, as a palliative and therapeutic agent. □

References

1. Peyromaure M, Thiounn N, Scotte F, Vieillefond A, Debre B and Oudard S. Collecting duct carcinoma of the kidney: a clinicopathological study of 9 cases. *J Urol* 2003;170:1138-140.
2. Maluf FH, Nanus DM, Herr H, Mazumdar M, Higgins G et al. Sequential doxorubicin/gemcitabine and ifosfamide, paclitaxel, and cisplatin chemotherapy in patients with metastatic or locally advanced transitional cell carcinoma of the urothelium. *Proc ASCO* 2000;19:3422.
3. Orsola A, Trias I, Raventos CX, Espanol I, Cecchini L, Orsola I. Renal collecting (Bellini) duct carcinoma displays similar characteristics to upper tract urothelial cell carcinoma. *Urology* 2005;65:49-54.
4. Milowsky MI, Rosmarin A, Tickoo SK, Papanicolaou N, Nanus DM. Active chemotherapy for collecting duct carcinoma of the kidney: a case report and review of the literature. *Cancer* 2002 94:111-116.
5. von der Maase H, Hansen SW, Roberts JT, Dogliotti L, Oliver T, Moore MJ, Bodrogi I, Albers P, Knuth A, Lippert CM et al. Gemcitabine and cisplatin versus methotrexate, vinblastine, doxorubicin, and cisplatin in advanced or metastatic bladder cancer: results of a large, randomized, multinational, multicenter, phase III study. *J Clin Oncol* 2000;18: 3068-3077.
6. Oudard S, Banu E, Vieillefond A, Fournier L, Priou F, Medioni J, Banu A, Duclos B, Rolland F, Escudier B et al. Prospective multicenter phase II study of gemcitabine plus platinum salt for metastatic collecting duct carcinoma: results of a GETUG (Groupe d'Etudes des Tumeurs Uro-Genitales) study. *J Urol* 2007;177:1698-1702.
7. Gollob JA, Upton MP, DeWolf WC, Atkins MB. Long-term remission in a patient with metastatic collecting duct carcinoma treated with taxol/carboplatin and surgery. *Urology* 2001;58:1058.
8. Tokuda N, Naito S, Matsuzaki O, Nagashima Y, Ozono S, Igarashi T. Collecting duct (Bellini duct) renal cell carcinoma: a nationwide survey in Japan. *J Urol* 2006;176:40-43;discussion 43.
9. Flanigan RC, Mickisch G, Sylvester R, Tangen C, Van Poppel H, Crawford ED. Cytoreductive nephrectomy in patients with metastatic renal cancer: a combined analysis. *J Urol* 2004;171:1071-1076.
10. Mejean A, Roupret M, Larousserie F, Hopirtean V, Thiounn N, Dufour B. Is there a place for radical nephrectomy in the presence of metastatic collecting duct (Bellini) carcinoma? *J Urol* 2003;169:1287-1290.
11. Mani S, Todd MB, Katz K, Poo WJ. Prognostic factors for survival in patients with metastatic renal cancer treated with biological response modifiers. *J Urol* 1995;154:35-40.