

Renal Cell Carcinoma: Review Questions

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QUESTIONS

Choose the single best answer for each question.

- A 56-year-old woman with a past history of cholelithiasis presents to her primary care physician for a follow-up visit. One week prior, she had been hospitalized with right upper quadrant abdominal pain that responded to medical therapy, and she was discharged home within 2 days. A computed tomography (CT) scan revealed gallstones, minimally distended bile ducts, a normal gallbladder wall, and a 2-cm complex mass in the left kidney. On this visit, she has no complaints. Physical examination is normal. Complete blood count and metabolic testing are normal. Her estimated creatinine clearance is 90 mL/min, and urinalysis shows no hematuria. What is the next step in the management of this patient?

 - Follow-up visit 3 months with a repeat CT scan
 - Refer to urology for surgical resection of the left kidney mass
 - CT-guided fine-needle aspiration (FNA) of the kidney mass
 - Refer to general surgery for elective cholecystectomy
 - Order an ultrasound of the abdomen to further characterize the gallstones and kidney mass
- Which of the following is correct regarding obesity, smoking, and risks for renal cell carcinoma?

 - Smoking has been associated with an increased risk of developing renal cell carcinoma but obesity has not
 - Obesity has been associated with an increased risk of developing renal cell carcinoma but smoking has not
 - Both smoking and obesity have been associated with an increased risk of developing renal cell carcinoma
 - Neither smoking nor obesity have been associated with an increased risk of developing renal cell carcinoma
- A 41-year-old man seeks advice regarding genetic testing for familial forms of renal cell carcinoma. He was diagnosed with metastatic renal cell carcinoma 1 year ago and currently is stable on therapy. He is married and has 2 adopted children. He is sterile due to childhood mumps, confirmed by objective sterility testing. He has 1 brother, aged 46 years, who is healthy. His father died at age 62 years from renal cell carcinoma. No other family member has had cancer. He is very close to his family, who support him in all decisions. How should this patient be advised regarding genetic testing for familial forms of renal cell carcinoma?

 - The patient should be tested
 - The patient should not be tested
 - The patient's brother should be tested
 - The patient and his brother should be tested
- A 62-year-old woman presents for a consultation regarding nephrectomy as a potential treatment for her newly diagnosed renal cell carcinoma. Two months ago, she developed hematuria. A CT scan revealed a 9-cm complex mass in the right kidney and 3 bilateral lung nodules measuring 1 to 3 cm. Bone scan and magnetic resonance imaging (MRI) of the brain were normal. Fine-needle aspirates of the kidney mass and one of the lung nodules both revealed renal cell carcinoma. She has no comorbidities and has normal cardiac, pulmonary, and renal function. What is the recommendation regarding nephrectomy in this case?

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- (A) The patient should undergo nephrectomy
 - (B) There is no reason for nephrectomy because the patient has metastatic disease
 - (C) Initiate interferon therapy and consider nephrectomy at a later time
 - (D) Nephrectomy is a high-risk surgery and would worsen this patient's quality of life
5. A 68-year-old man presents to the oncologist regarding therapy for metastatic renal cell carcinoma. Three years ago, the patient developed right flank pain and was found to have a large kidney mass. He underwent a radical nephrectomy. Pathologic testing revealed an 8-cm tumor, clear cell type, Fuhrman grade III, extending into the fat but not through the Gerota's fascia, and 1 of 9 lymph nodes revealed metastatic renal cell carcinoma. A follow-up CT scan 1 month ago revealed 3 liver lesions measuring 1 to 2 cm, mediastinal lymphadenopathy, and a few subcentimeter lung nodules that were not present on a CT scan 6 months ago. Evaluation of fine-needle aspirate of a liver lesion confirmed metastatic clear cell type renal cell carcinoma. He is fully active and asymptomatic. Past medical history includes a myocardial infarction followed by a triple-vessel coronary artery bypass graft surgery 5 years ago. His cardiac ejection fraction has been between 40% and 50% for years. Medications include aspirin, atenolol, and lisinopril. Physical examination is normal. Complete blood counts are normal and serum creatinine is 2.5 mg/dL and stable since the nephrectomy. Bone scan is normal. How should this patient be managed?
- (A) Subcutaneous interferon alfa
 - (B) High-dose interleukin 2
 - (C) Sorafenib or sunitinib
 - (D) Metastasectomy or radiofrequency ablation of the 3 liver lesions
 - (E) Observation
6. A 55-year-old man presents to his primary care physician with worsening fatigue for the last 3 months. Two weeks ago, he developed rib pain, and a chest radiograph revealed multiple lung and rib lesions. CT confirmed multiple lung, bone, and liver lesions and a 12-cm mass in the right kidney. Biopsy of a lesion in the rib was consistent with metastatic renal cell carcinoma, clear cell type. Prior to presentation 2 weeks ago, he had been healthy. He takes ibuprofen for pain. On questioning, he states that he has constipation, mild postural dizziness, and generalized weakness, and he has had occasional headaches all of his life without recent changes.

On physical examination, he looks slightly lethargic but he is alert, oriented, and able to give an appropriate history. Temperature is normal, heart rate is 90 bpm, blood pressure is 105/62 mm Hg, and respiratory rate is 16 breaths/min. Neurologic examination demonstrated generalized weakness, no focal deficits, deep tendon reflexes 1+ and symmetrical, normal gait, and intact senses. The remainder of the physical examination is unremarkable. After ordering basic laboratory tests, what is the next best step in the management of this patient?

- (A) Order immediate MRI of the brain
- (B) Start sorafenib or sunitinib
- (C) Administer opiates and refer to hospice
- (D) Refer to urology for evaluation for nephrectomy
- (E) Aggressive intravenous hydration

ANSWERS AND EXPLANATIONS

1. **(B) Refer to urology for surgical resection of the left kidney mass.** Most complex kidney masses are malignant; thus, primary management is surgical resection of the mass. Because the goal in early-stage renal cell carcinoma is cure, definitive therapy should not be delayed. Although a CT-guided FNA of the kidney mass might confirm the diagnosis, surgical intervention is still mandatory because a negative FNA does not exclude malignancy.¹
2. **(C) Both smoking and obesity have been associated with an increased risk of developing renal cell carcinoma.** Cigarette smokers have an increased risk of developing renal cell carcinoma, which has been directly related to intensity (number of cigarettes) and duration (years smoked) of smoking. Long-term quitters (> 15 yr) and those who started smoking late in life have a lower risk of renal cell carcinoma as compared with current smokers (relative risk, 1.2 versus 1.7 compared with the population that has never smoked).² Similarly, there is a direct correlation between increased body weight and risk of developing renal cell carcinoma in both men and women. This risk is in direct proportion to body mass index. The adjusted risk for patients with a body mass index greater than 40 kg/m² is approximately 3.7 times higher than that in patients with a normal body mass index (body mass index, 20–25 kg/m²).²
3. **(A) The patient should be tested.** Because the patient is the index case, he should be tested first. If the patient is found to have a genetic mutation associated with a familial form of renal cell carcinoma,

then his brother should be tested. If the brother is found to have the same mutation, his offspring should be tested as well. If results of genetic testing on the case patient are negative, other family members should not be tested.

4. (A) The patient should undergo nephrectomy. Nephrectomy can help manage symptoms caused by the primary tumor. Because the patient is experiencing hematuria, surgery would be the fastest way to relieve her symptoms in preparation for systemic therapy for metastatic disease. Selected patients with solitary or a limited number of distant metastases may achieve prolonged survival with nephrectomy and surgical resection of the metastases.^{3,4} The operative risk in this patient is low, and most patients recover from surgery within 1 week. Currently, there are more effective first-line therapies for renal cell carcinoma than interferon.¹

5. (C) Sorafenib or sunitinib. In randomized controlled studies, sorafenib and sunitinib agents have demonstrated an increased response rate, reduced toxicity, and improved survival compared with interferon alfa in patients with renal cell carcinoma.^{5,6} This patient is not a candidate for high-dose interleukin 2 due to his cardiac and renal dysfunction. Metastectomy or ablation of metastases may be considered in the future if the patient achieves a good response to systemic therapy. Observation is a less desirable option in this

patient, since there has been objective evidence of disease progression over the past 6 months.

6. (E) Aggressive intravenous hydration. This patient has classic signs and symptoms of hypercalcemia and should be managed with hydration (approximately 6 L/day). Bisphosphonates should be started early, but it will take several days for their full effect to be achieved. In addition to hydration, calcitonin can be added to control a high calcium level within the first 2 to 3 days. Loop diuretics should not be used until the patient is adequately hydrated.

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