

1. Which of the following is most helpful in differentiating chromophobe RCC from an oncocytoma:
  - A. Binucleation

Answer: C. Both chromophobe RCC and oncocytomas can have binucleation, a granular cytoplasm, and pleomorphism. Peri-nuclear halos can be very helpful in differentiating an oncocytoma from a chromophobe RCC. (*Tumors of the Kidney, Bladder, and Related Urinary Structures*. Murphy, W., et al. AFIP Tumor Fascicle Series #1. 2004. p. 156-157)

2. A 30 y/o African American male whose mother has sickle cell disease, is found to have a renal mass by CT examination. Which of the following are the most likely histologic features of this mass:

- C. Reticular / yolk sac-like pattern with focal areas having an adenoid-cystic pattern.

Answer: C. Medullary RCC is almost always found in patients with sickle cell trait. It can be characterized by a reticular or yolk-sac pattern with focal areas having an adenoid cystic pattern. Neutrophils are also common. Answer A is descriptive of a collecting duct RCC.. Answer B is the classic description of a clear cell (conventional) RCC. (*Tumors of the Kidney, Bladder, and Related Urinary Structures*. Murphy, W., et al. AFIP Tumor Fascicle Series #1. 2004. p. 136-144)

3. An 18 y/o Caucasian male is found to have a renal tumor with clear cell RCC histology. It is important to perform cytogenetic analysis on this mass to look for involvement of which of the following chromosomes:

- B. Xp11.2

Answer: B. There are a subgroup of tumors occurring in the pediatric age group with Xp11.2 translocations and may have a different prognosis beyond the morphologic classification. (*Tumors of the Kidney, Bladder, and Related Urinary Structures*. Murphy, W., et al. AFIP Tumor Fascicle Series #1. 2004. p. 102-103)

4. A 5 cm mass is removed from a 41 y/o female which is found to have areas of smooth muscle cells, blood vessels, and fat. Special stains for HMB-45 were positive. This lesion is associated with all of the following conditions EXCEPT:

- C. Birt-Hogg-Dube syndrome

Answer: C. Birt-Hogg-Dube syndrome has been associated with clear cell, papillary, and chromophobe types of RCC. (*Tumors of the Kidney, Bladder, and Related Urinary Structures*. Murphy, W., et al. AFIP Tumor Fascicle Series #1. 2004. p.106) *Test taking strategy*. This is a three neuron question (popular on board exams). First, recognize the lesion being described is an angiomyolipoma. Then we must remember the associations with AMLs. Tuberos scleros is the one most often remembered, but VHL and NF-1 are also associated. The dirty trick in this question is most will recognize VHL being associated with clear cell RCC, leading one down the wrong track. Unfortunately, clear cell RCC is not the only thing in the kidney associated with VHL.

5. According to the AJCC staging manual, all of the following affect the pathological staging of renal cell carcinoma EXCEPT:

- C. Fuhrman grade

Answer: C. Fuhrman grade is prognostically important, but is not a component of the AJCC 2002 staging criteria.

6. An incidental renal lesion <1cm with papillary features and composed of predominantly clear cells is best classified as:

B. Renal cell carcinoma, clear cell type

Answer: B. A renal neoplasm composed predominantly of clear cells is considered RCC, clear cell type irregardless of size or architecture. Recent studies have shown a majority of these lesions to have chromosome 3p deletions characteristic of RCC clear cell type. (M. E. Salama MD, M. J. Worsham PhD and M. DePeralta-Venturina MD. 2003: Malignant Papillary Renal Tumors With Extensive Clear Cell Change: A Molecular Analysis by Microsatellite Analysis and Fluorescence In Situ Hybridization. *Archives of Pathology and Laboratory Medicine*: Vol. 127, No. 9, pp. 1176–1181.) *Test taking strategy*. Papillary adenoma is used when an incidental lesion <0.5 cm is found, which is papillary and does not have a clear cell component. Options C and D can be eliminated because they are the same thing, and option E is not a particularly good option because one should feel the lesion can be classified on the information given.

7. Which of the following result in the highest stage for a renal cell carcinoma according to the 2002 AJCC staging manual:

A. Tumor invades beyond Gerota's fascia

Answer: A. Invasion beyond Gerota's fascia makes the tumor pT4 and therefore Stage IV. It takes two or more regional lymph node metastasis before the Stage becomes IV. B, C, and D are all pT3 lesions, which can not be Stage IV unless accompanied by either two regional lymph node metastases or distant metastasis.

8. A renal tumor has predominantly clear cells with the highest grade area containing cells with irregular nuclear border (size ~20um) and nucleoli visible from 10X. Many of the cells are noted to have eccentrically placed nuclei and eosinophilic cytoplasm. The best Fuhrman grade is:

D. Fuhrman grade IV

Answer: D. The initial description is c/w Fuhrman grade III, but eccentrically placed nuclei with eosinophilic cytoplasm is characteristic of rhabdoid features. In addition to pleomorphic tumors (worse looking than Fuhrman grade III), tumors with sarcomatoid or rhabdoid features are classified as Fuhrman grade IV.

9. The best diagnosis for the renal mass illustrated in the image 1 set on the website (Vol. 1, No. 10 – Renal Tumors, Part 2) is which of the following:

A. Renal Cell Carcinoma, Conventional

Answer: A. This example illustrates an eosinophilic variant of a conventional renal cell carcinoma. Questions 9-11 provide a nice comparison between answers A, B, and D. Note the typical conventional RCC vascular pattern.

10. The best diagnosis for the renal mass illustrated in the image 2 set on the website (Vol. 1, No. 10 – Renal Tumors, Part 2) is which of the following:

B. Renal Cell Carcinoma, Chromophobe

Answer: B. This case illustrates a chromophobe RCC with an oncocytoma-like appearance. Note the perinuclear halos in this case. While both oncocytomas and chromophobe RCC can have binucleation and pleomorphism, oncocytomas should not have perinuclear halos.

11. The best diagnosis for the renal mass illustrated in the image 3 set on the website (Vol. 1, No. 10 – Renal Tumors, Part 2) is which of the following:

D. Oncocytoma

Answer: D. This is a nice example of an oncocytoma. Note the eosinophilic cytoplasm and lack of any clear cut perinuclear halos.

12. The best diagnosis for the renal mass illustrated in the image 4 set on the website (Vol. 1, No. 10 - Renal Tumors, Part 2) is which of the following:

D. Metanephric adenoma

Answer: D. These images are representative of a nephrogenic adenoma. Note the papillary like areas, which if considered alone might make one consider a papillary type RCC.

13. Image 5 on the website (Vol. 1, No. 10 - Renal Tumors, Part 2) shows a renal tumor stained with Hale's Colloidal Iron. The most likely diagnosis is:

D. RCC, chromophobe type

Answer: D. Chromophobe type RCCs characteristically stain with Hale's colloidal iron. It should be noted that this is a difficult stain, which may be challenging to perform and interpret. It is this author's recommendation to have a clear understanding of the H&E histology of this tumor (including the spectrum from vegetable-like cells to oncocytoma-like features)

14. This tumor from the kidney illustrated in image 6 on the website (Vol. 1, No. 10 - Renal Tumors, Part 2) was negative for S-100 and desmin. In other areas of the tumor, RCC marker was focally positive. Which of the following is the best diagnosis?

A. RCC, Fuhrman grade IV

Answer: A. The best answer given the limited information is an area of sarcomatoid differentiation within a conventional type RCC. This is not an infrequent occurrence, and is important because it makes the Fuhrman grade automatically IV. S-100 is a sensitive marker which excludes B as a viable answer, and both a leiomyoma and rhabdomyosarcoma should both be positive for desmin.