Patient With a Renal Mass

Radiology Pathology Rotation

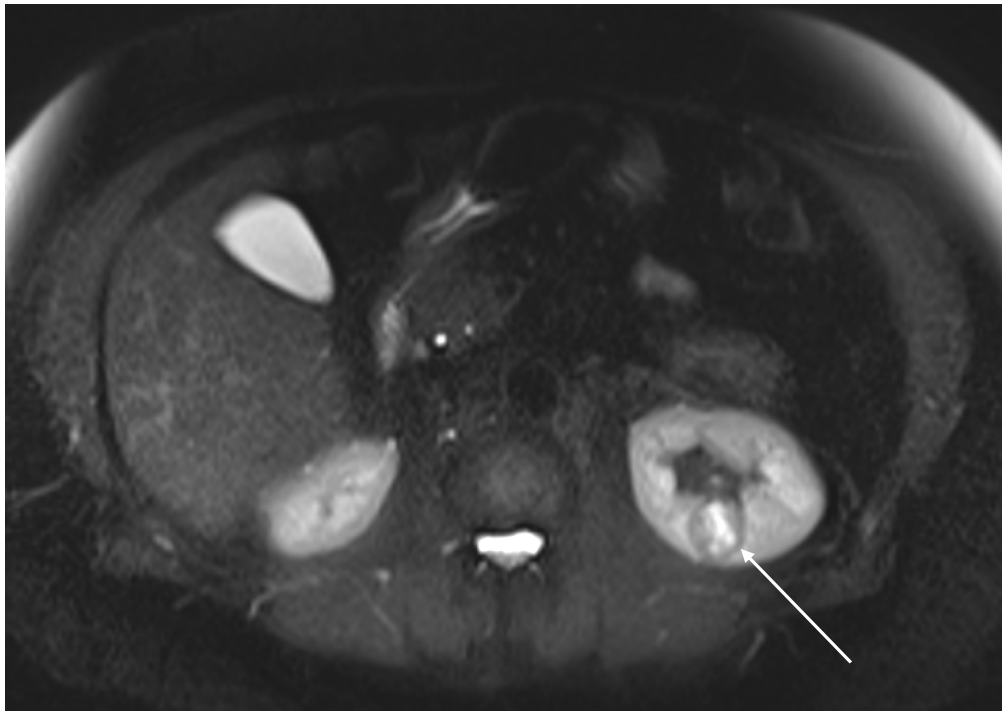
Sina Mazaheri, MS4

The Patient

- 64 y.o. female with a history of kidney stones, who originally presented complaining of two episodes of gross hematuria. A CT scan, and a subsequent MRI was performed which demonstrated a 2.2 cm mass in the upper pole of the left kidney

- Per recommendation of the urology team, patient presented to UVA body procedures for a biopsy of the lesion

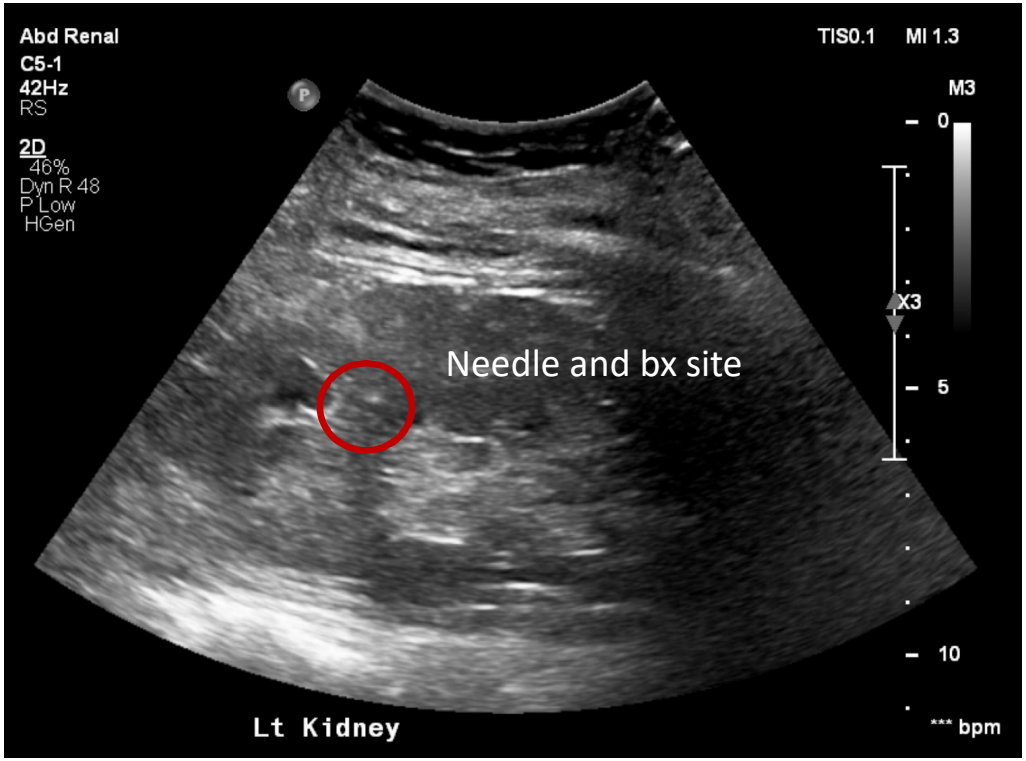
CT and MR Imaging



Biopsy

- Given the low visibility of the mass in CT imaging, it was decided to proceed with a biopsy under US guidance
- Unfortunately the lesion was isoechoic and not clearly distinguishable under US either.
- Ultimately 6 x 22G FNA (no abnormal cells on multiple tries) and 3 x 18G core biopsies of the mass were performed.

Intraprocedural Ultrasound



Pathology Results

- “Given the cytologic variability, an immunohistochemical (IHC) stain for Carbonic Anhydrase IX (CA IX) was performed and shows diffuse, membranous positivity, leading us to favor conventional, **clear cell type of renal cell carcinoma**”

Renal Cell Carcinoma

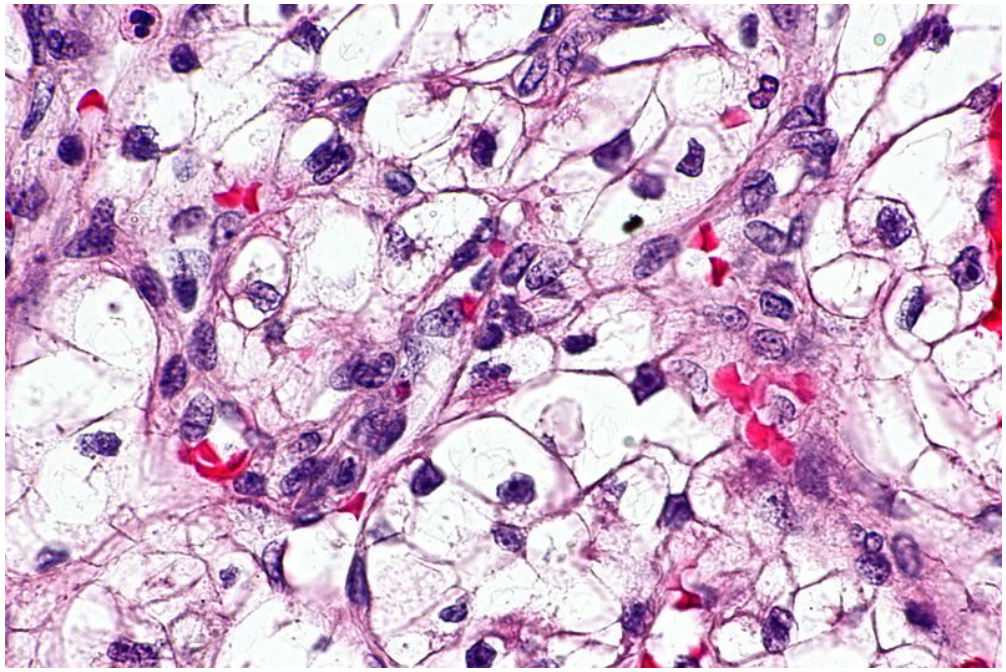
- Primary malignant adenocarcinomas derived from the renal tubular epithelium
- Most common renal malignancies
- Subtypes
  - ***Clear cell carcinoma (70-80% of RCC)***
  - Papillary renal cell carcinoma (10-15% of RCC)
  - Chromophobe renal carcinoma (5% of RCC)
  - Collecting duct (Bellini duct) carcinoma (1% of RCC).
  - Renal medullary carcinoma (Rare)
  - Sarcomatoid renal cell carcinoma (Advanced RCC transformation)

Radiographic Features

- Ultrasound
  - Widely varying sonographic appearance:
    - Shape: Solid or partially cystic
    - Echogenicity: hyper, iso, or hypoechogenic to the surrounding tissue
- CT
  - Lesions have a soft tissue attenuation between 20-70 HU, and usually show less enhancement than the normal cortex.
  - Larger lesions frequently have areas of necrosis, with about 30% showing some calcification.
  - Small lesions may enhance a similar amount and be difficult to detect.
- MRI
  - Helpful in diagnosing the lesion, and even identifying the histology:
    - T1: often heterogeneous due to necrosis, hemorrhage and solid components
    - T2: appearances depend on histology 6
      - clear cell RCC: hyperintense (similar to our case)
      - papillary RCC: hypointense

Clear Cell RCC Histological Features

- Clear cytoplasm (due to high lipid content)
- May have eosinophilic cytoplasm.
- Hyaline bodies
- Delicate branching vasculature (called "chicken wire-like" vasculature)
- Polygonal cells.
- Central nucleus.



Patient Follow Up

- Per multidisciplinary team recommendation, patient is to proceed with ablation of the renal mass, due to lower complication rate, and a better chance of saving the kidney.

Resources

- Hertzberg, Middleton. Ultrasound: The Requisites, 3rd Edition, Elsevier. ISBN:0323086187
- Ng CS, Wood CG, Silverman PM et-al. Renal cell carcinoma: diagnosis, staging, and surveillance. AJR Am J Roentgenol. 2008;191 (4): 1220-32. doi:10.2214/AJR.07.3568
- Cotran, Ramzi S.; Kumar, Vinay; Fausto, Nelson; Nelso Fausto; Robbins, Stanley L.; Abbas, Abul K. (2005). Robbins and Cotran pathologic basis of disease (7th ed.). St. Louis, Mo: Elsevier Saunders. pp. 1017-8. ISBN 0-7216-0187-1.