# Ball on a Bean: US Biopsy of Solid Renal Mass

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### Presentation: FD 1189024

FD 72M PMH T2DM, HTN, Diabetic neuropathy, hypercholesterolemia, COPD, stroke, chronic low back pain was admitted to Augusta for an **AKI** and treated for **nephrotic range proteinuria** in the setting of CKD III (D/C 4/29/2019)

Imaging during hospitalization:

US Bilateral Renal & CT Abdomen and Pelvis WO Contrast

Procedures during hospitalization:

Biopsy of R Kidney



# **US Bilateral Renal**

Arising from the upper pole of the right kidney is a  $3.9 \times 3.3 \times 3.5$  cm in size solid mass with Doppler evaluation showing vascularity within it.

This is highly suspicious for renal cell carcinoma.

Moderate hydronephrosis of the right kidney probably related to patient's known retroperitoneal fibrosis





## **CT Abdomen Pelvis WO Contrast**

Kidneys and ureters: 3.9 cm mass lateral upper pole right kidney which cannot be characterized on noncontrast CT but is of heterogeneous attenuation measuring up to 32 Hounsfield units and most likely represents a renal cell carcinoma.

There is moderate bilateral hydronephrosis, left greater than right. Localized high attenuation and calcification along the posterior lateral margin of the left kidney compatible with a subcapsular hematoma.









### **R** Native Kidney Biopsy

MEMBRANOUS GLOMERULOPATHY.

DIABETIC GLOMERULOSCLEROSIS, MODERATE.

FOCAL SEGMENTAL GLOMERULOSCLEROSIS, CELLULAR-TYPE.

MODERATE TUBULAR ATROPHY AND MODERATE INTERSTITIAL FIBROSIS.

SEVERE ARTERIAL SCLEROSIS.



#### Light Microscopy

Four corticomedullary cores are examined at 10 levels of section with H&E, PAS, Jones, and Trichrome stains.

Thirteen glomeruli, four of which are globally sclerotic, demonstrate moderate mesangial expansion and thickened capillary loops.

Glomeruli also have enlargement and three demonstrate segmental sclerosis with endocapillary hypocellularity.

Capillary loop deposits are visible on Jones staining. A moderate lymphocytic interstitial infiltrate includes a few eosinophils. Moderate tubular atrophy is accompanied by moderate interstitial fibrosis. Arteries are severely sclerotic with no inflammation. A Congo red stain is negative.



#### Not the patient



# Immunoflourescent Microscopy

Up to two glomeruli, neither of which is globally or segmentally sclerotic, are triaged.

Granular capillary loop and possible mesangial staining is seen with IgG (3+), C3 (2+), kappa light chain (3+), and lambda light chain (2+). T

There is no significant glomerular or tubular staining with IgA, IgM, C1q, or fibrinogen.

Immunofluorescent staining for PLA2R is negative.

The scale used is trace through 3+.





#### **Electron Microscopy**

Five glomeruli, one of which is segmentally and none of which is globally sclerotic, are triaged.

Ultrastructural examination of a single glomerulus demonstrates moderate mesangial expansion by basement membrane-like material.

Capillary loops **demonstrate numerous superficial and intramembranous immune complex-type electron dense deposits**, some of which are surrounded by a lucent rim.

Visceral epithelial cell foot processes are severely effaced.

No mesangial deposits or tubuloreticular inclusions are identified.

Proximal convoluted tubules and peritubular capillaries are ultrastructurally unremarkable.



Not the patient



# Significance of PLA2R Testing

Antigen phospholipase A2 receptor (PLA2R) within immune deposits in a fine, granular, capillary-loop pattern is strongly suggestive of primary MN

~70 to 80 percent of patients presumed to have primary MN have a positive test for anti-PLA2R antibody at the time of renal-biopsy diagnosis of MN.

By contrast, some patients with primary MN will have a negative anti-PLA2R antibody test.



In this patient's case...

"Given the PLA2R negativity and the clinical history of a probable renal cell carcinoma, this patient's membranous glomerulopathy may be secondary to malignancy."



#### US Guided Biopsy R Renal Mass 6/6

Technically successful US guided biopsy x 3 of right renal mass



## Pathology Report: Oncocytoma

Most common benign solid renal tumor, approximately 3-7% of all primary renal neoplasms. Arise from intercalating cells of collecting duct.

Gross: well circumscribed and spherical, consistent with benign nature. Homogenous, mahogany on cross section (vs yellow RCC). Central scar suggestive but not pathognomonic for tumor.

Cytoplasmic features: cytoplasm with eosinophilic granules (vs cytoplasmic clearing of conventional and chromophobe RCC)

Nuclear features: predominantly smooth and round, binucleation and mitotic features rare (vs the wrinkled and multinucelated chromophobe RCC)

Architecture: nests of cells (vs the sheets chromophobe RCC)





#### Characteristics of Oncocytoma vs RCC on CT

Calcifications in 43% RO vs 20% ChRCC (P = 0.011)

Stellate scar in 46% RO vs 26% ChRCC (P = 0.025)

Spoken-wheel-like enhancement in 73% RO vs 20% with ChRCC (P < 0.001). Segmental inversion in 70% RO vs 17% ChRCC (P < 0.001)

Combined evaluation of stellate scar, spoken-wheel-like enhancement, and segmental enhancement inversion features were found to have a sensitivity of 99.1%, a specificity of 100%, a positive predictive value of 100%, and a negative predictive value of 75%.

## Works Cited

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