AMSER Rad Path Case of the Month:

44-Year-Old Man with Renal Incidentaloma

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Patient Presentation

Clinical history

- Asymptomatic 40M presents for evaluation of left kidney mass discovered on CT in 2018
- Interval changes noted on follow-up imaging this year

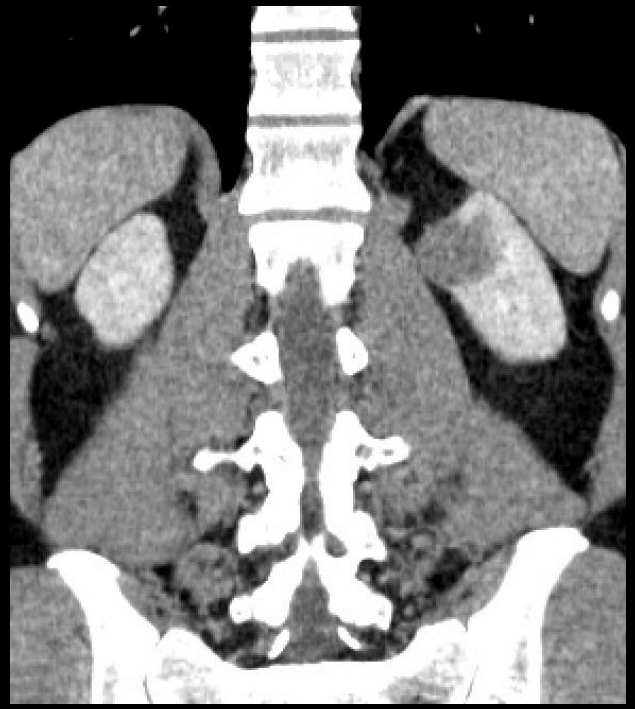
Family history

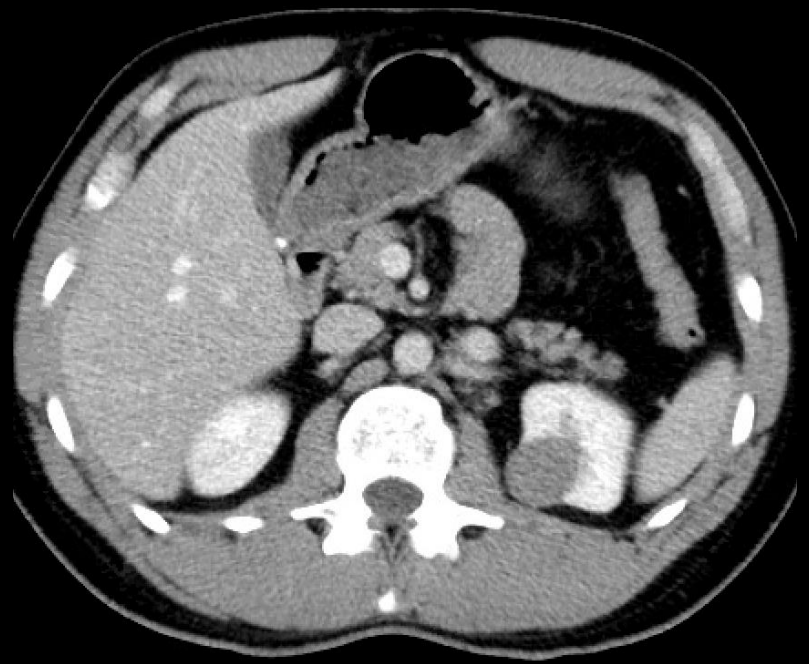
- No known family history of renal cancer or familial syndromes

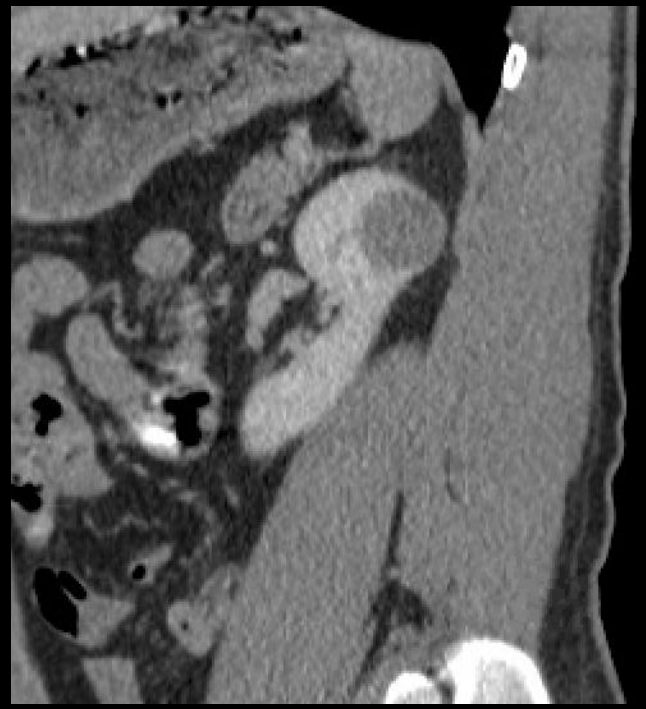
Physical exam findings

- Unremarkable

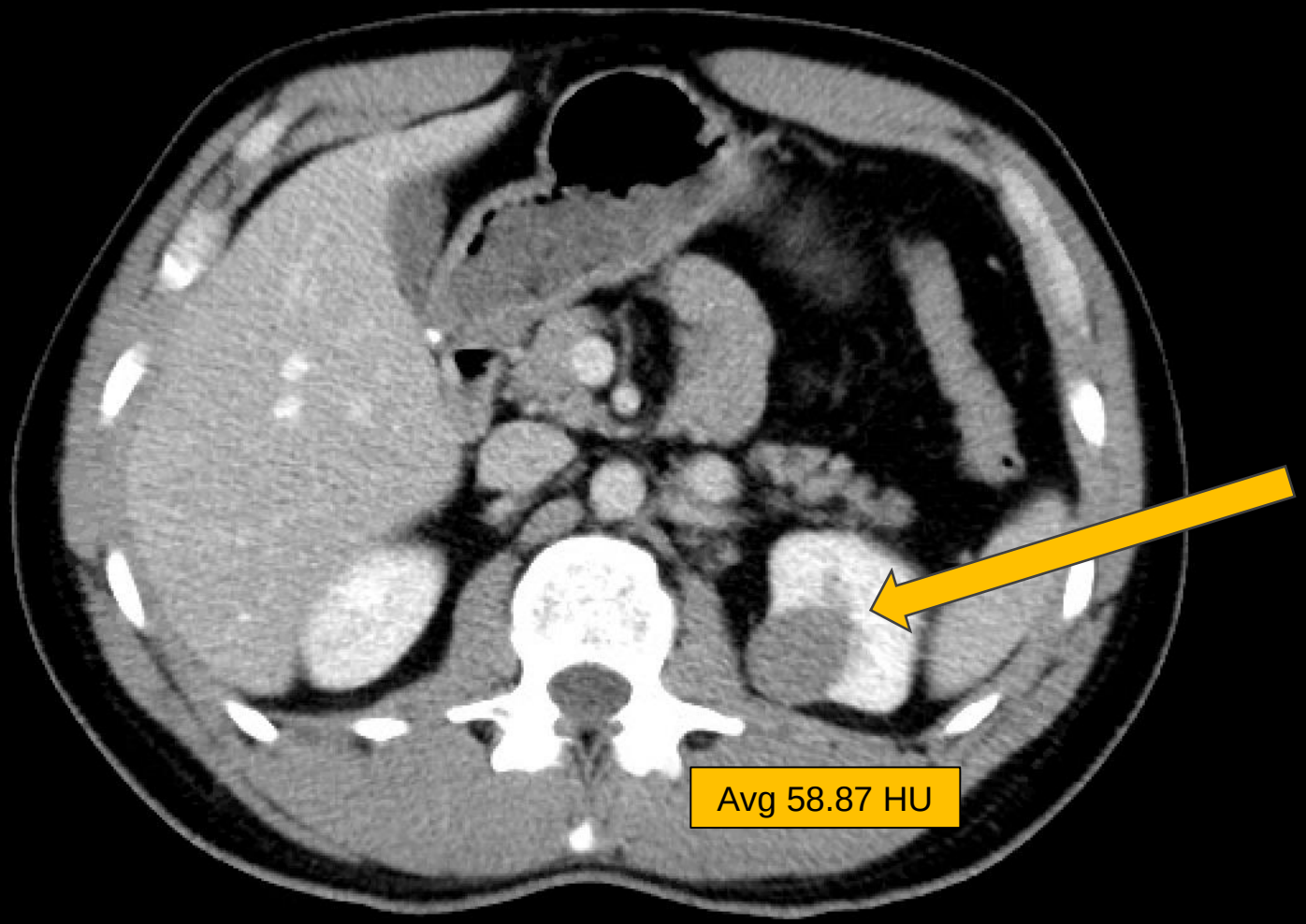
CT Abdomen with Contrast







CT Abdomen with Contrast



Post-contrast CT demonstrates a mildly enhancing and heterogenous, exophytic mass in the upper pole of the left kidney

The lesion measures 3.2 x 2.3 cm which is increased from 0.8 x 0.5 cm in 2018

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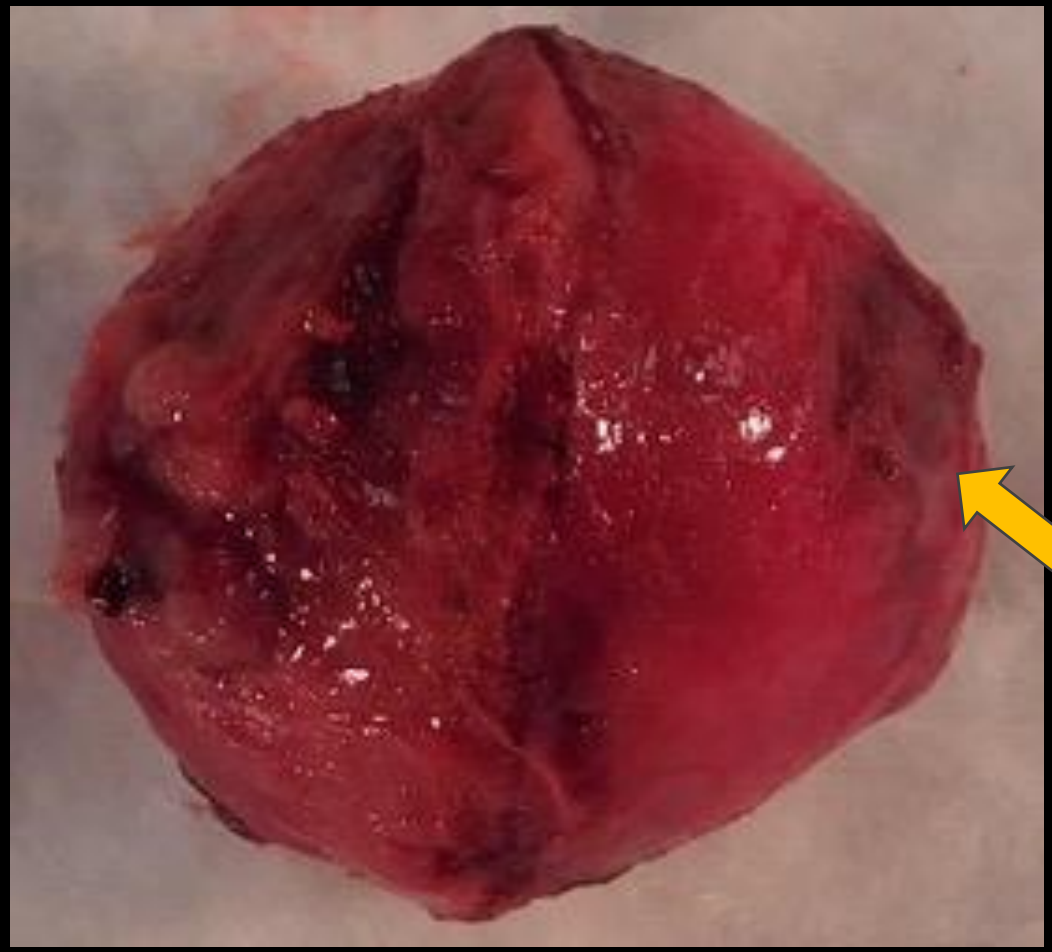
DDX (based on imaging)

- Renal Cell Carcinoma
- Oncocytoma
- Minimal Fat Angiomyolipoma (AML)
- Urothelial Mass of Pelvis and Collecting System
- Lymphoma
- Metastasis

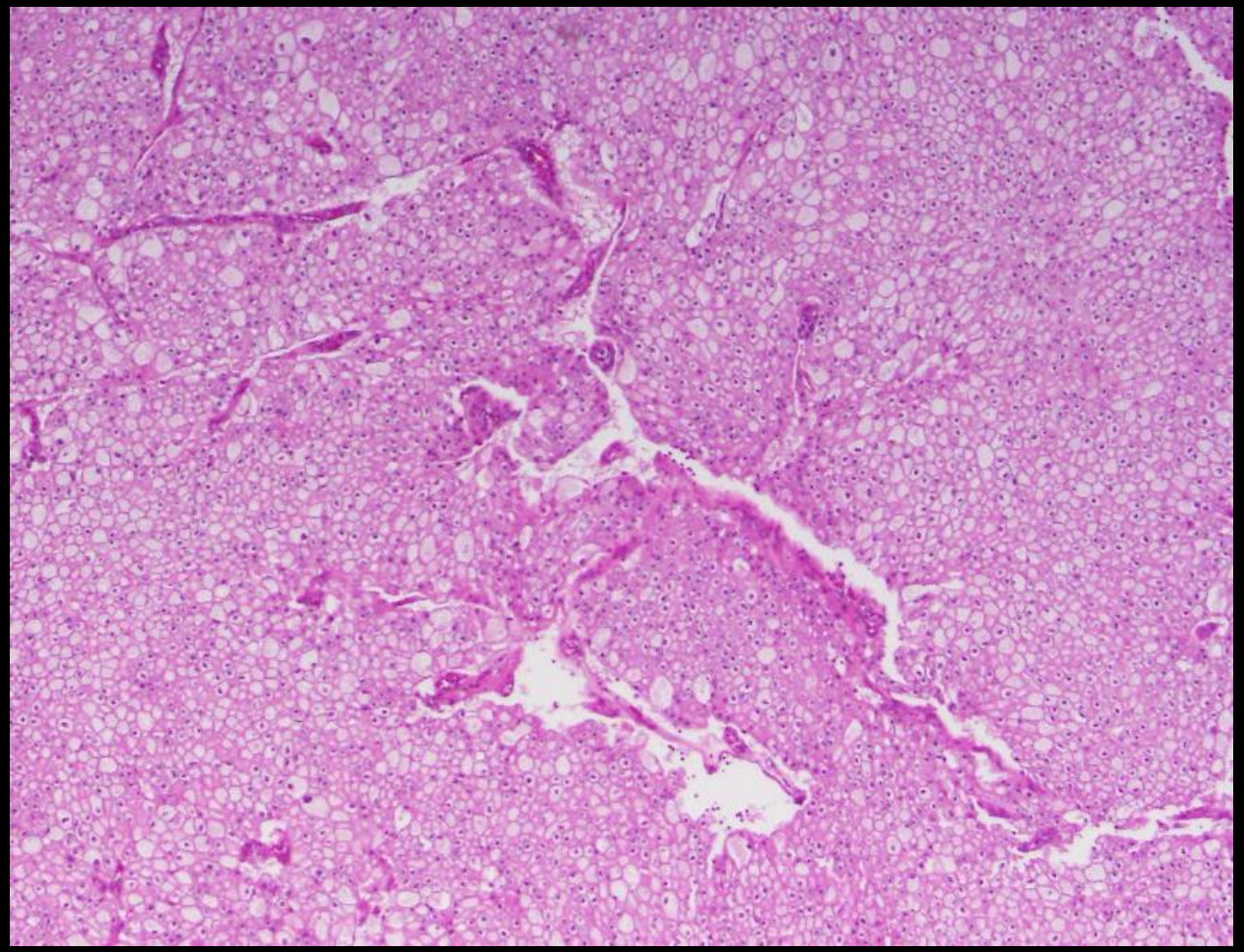
Gross Pathology



3.1 x 2.9 x 2.9 cm left nephrectomy specimen. There is a clear delineation between the renal parenchyma on the left and mass on the right

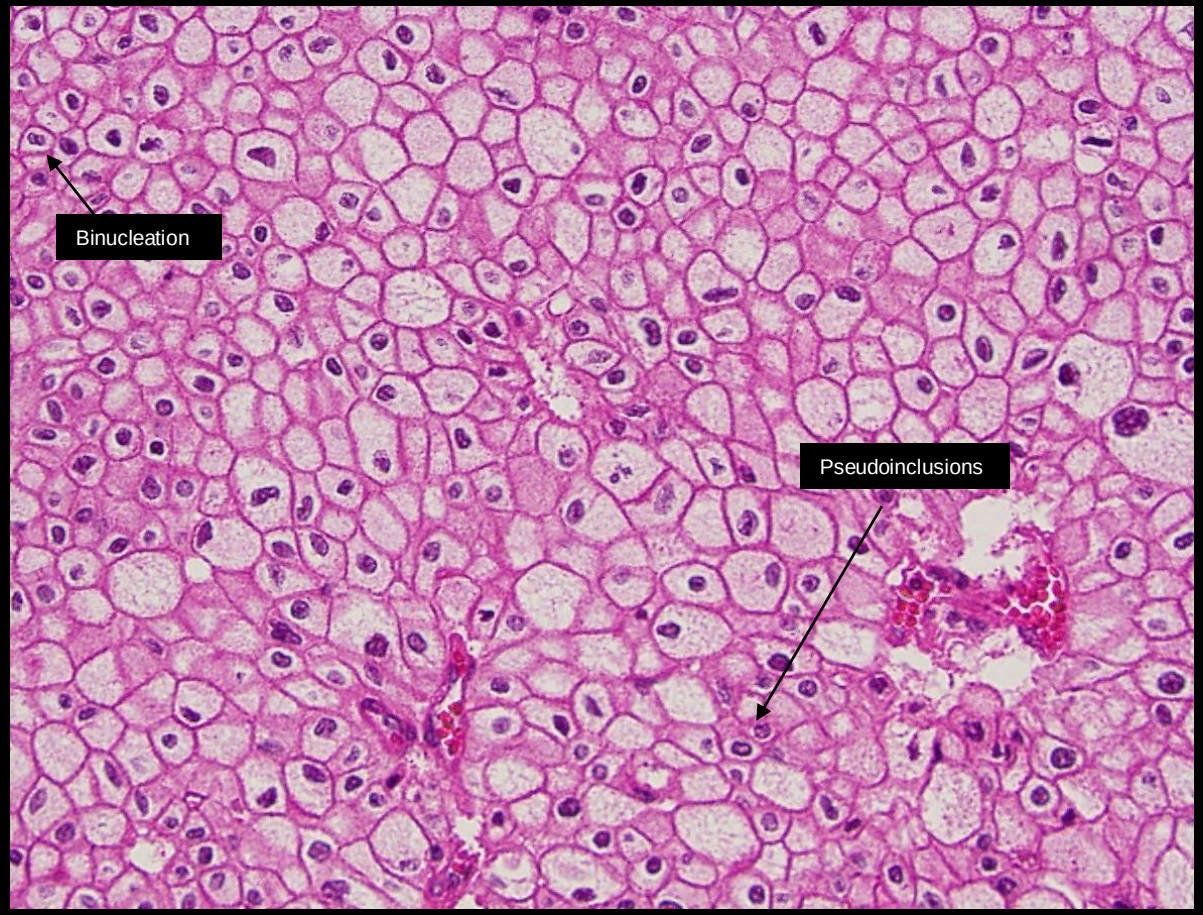
The mass is well-circumscribed and completely encapsulated apart from a 0.8 x 0.4 cm brown and friable defect, which may represent necrosis

Micro Path



Low power view demonstrates sheets of large polygonal cells oriented along hyalinized stroma

Micro Path



Cells demonstrate perinuclear halos within a flocculent cytoplasm that condenses around the edges, giving the appearance of thick prominent “vegetable-cell” borders

Cells are frequently binucleate and some have nuclear pseudoinclusions

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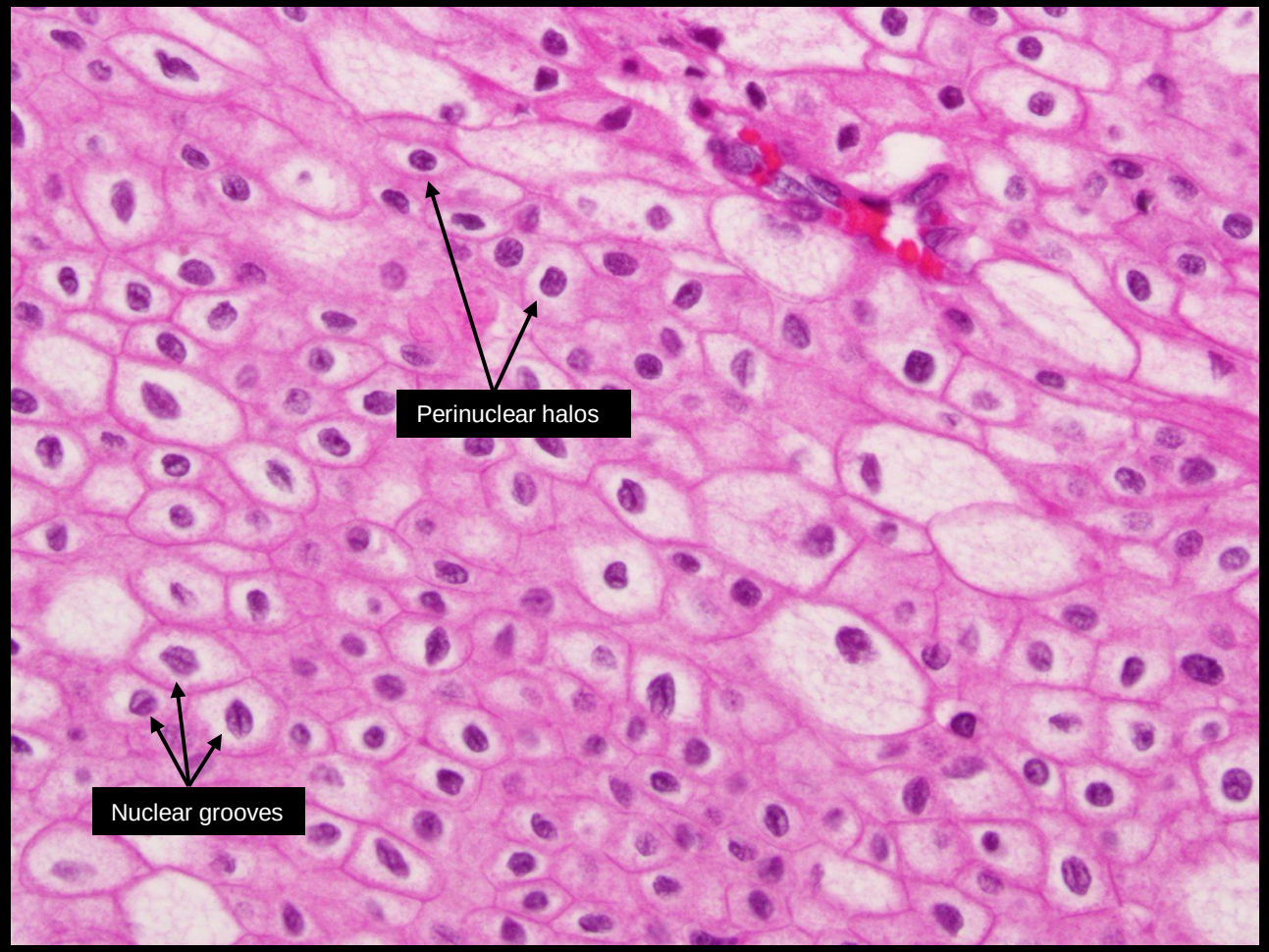
Micro Path



Nuclei have a koilocytic “wrinkled raisinoid” appearance

Perinuclear halos and nuclear grooves are visualized throughout the view

Note again the flocculent or finely reticulated cytoplasm, better seen at higher power

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Final Dx:

Chromophobe Renal Cell Carcinoma

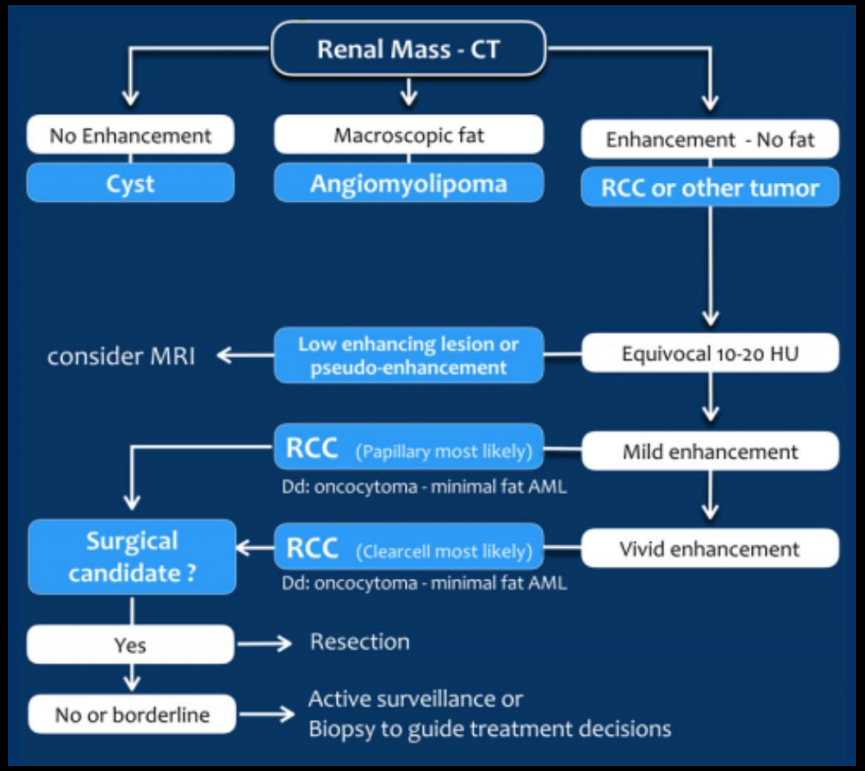
Case Discussion

Renal Incidentaloma Work-up

- Indeterminate masses require additional imaging
  - Too small to conclusively interpret as benign or malignant
  - Improper imaging protocol to sufficiently assess all relevant features
- MRI and multiphase renal protocol CT, with and without contrast
  - Similar diagnostic accuracy, though CT is preferred when masses have cystic components
- Increasing tumor size, male gender, and contrast enhancement are strong predictors for malignancy and higher tumor grade
  - Should be considered when deciding on continued surveillance vs biopsy/excision

Case Discussion

CT Characteristics To Describe Masses:



Adapted from "Solid Masses," by Reingard, van der Zon-Conijn, and Smithuis. TheRadiologyAssistant.

- Presence of fat
  - Density less than water or soft tissue
  - Suggestive of angiomyolipoma
- Enhancement
  - Increased signal > 20 Hounsfield units after contrast
  - Absence is likely benign (cyst)
  - Presence is concerning for malignancy
- Cystic components
  - Findings are characterized by the Bosniak criteria
    - Septa and/or calcifications – benign
    - Wall irregularity and/or enhancement – likely malignant

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Case Discussion

Background

- Chromophobe variant is the third most common subtype of renal cell carcinoma (RCC)
  - Arises from intercalated cells of the collecting system
  - Accounts for 5-7% of all RCCs
- Mean incidence in the 6th decade with no gender predilection
- Generally presents at an earlier stage with a better prognosis than other RCC variants
  - 5- and 10-year cancer specific survival (CSS) are 93% and 88.9% respectively

Case Discussion

Radiologic Features

- Solid and sharply demarcated from renal cortex, may be lobulated
- Contrast enhancement is often homogenous on CT and MRI
- Most are hypovascular to renal cortex with moderate contrast uptake (80-100 HU) on CT
- Distinguishing from other mimics:
  - Tends to be more homogenous and less intense than clear cell variant
  - Indistinguishable from oncocytomas on imaging
  - Lacks low signal on fat-suppression MRI seen in AML or clear cell variant

Case Discussion

Histopathologic Features

- Arranged in sheet or alveolar pattern around thick hyalinized vessels
- Two cytomorphologic variants of cells:
  - Classic: Large polygonal cells with pale reticulated cytoplasm and koilocytic nuclei
  - Eosinophilic: Round cells with dense, pink, granular cytoplasm and round nuclei
- Central nuclei with perinuclear clearing results in prominent cell borders with ”plant-cell appearance”
- Nuclei are often binucleate or grooved and pseudoinclusions can sometimes be present

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