NYU Long Island School of Medicine

DEPARTMENT OF PATHOLOGY

Short Report in Pathology

Organ system: Genitourinary Tract

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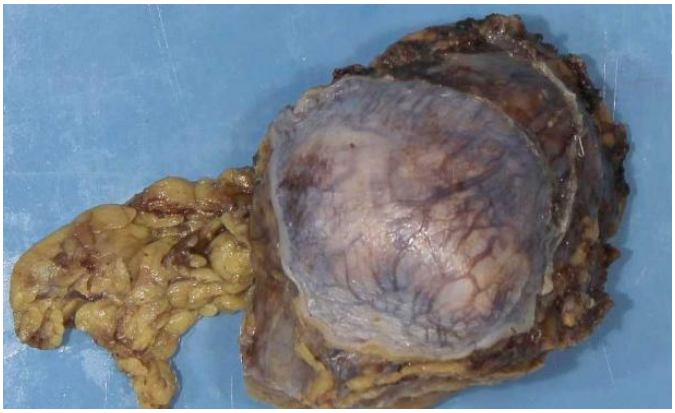
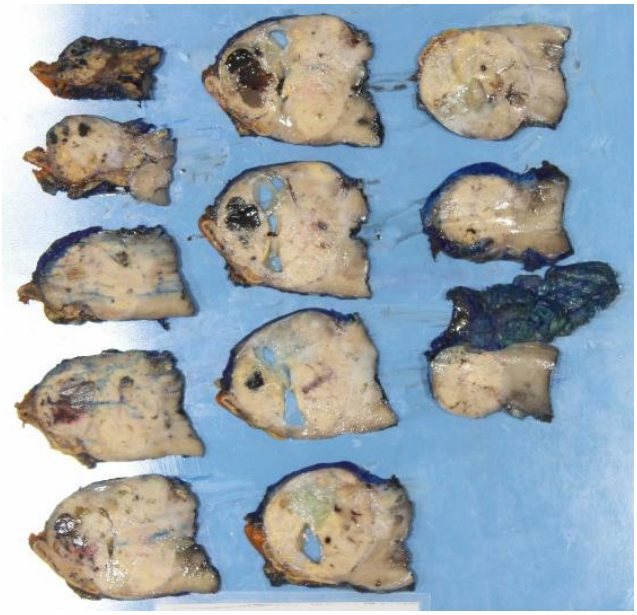
History:

Patient is a 64-year-old male with a history of bladder cancer, with right kidney mass seen on imaging with concern for adrenal invasion. Patient underwent right partial nephrectomy and adrenalectomy.

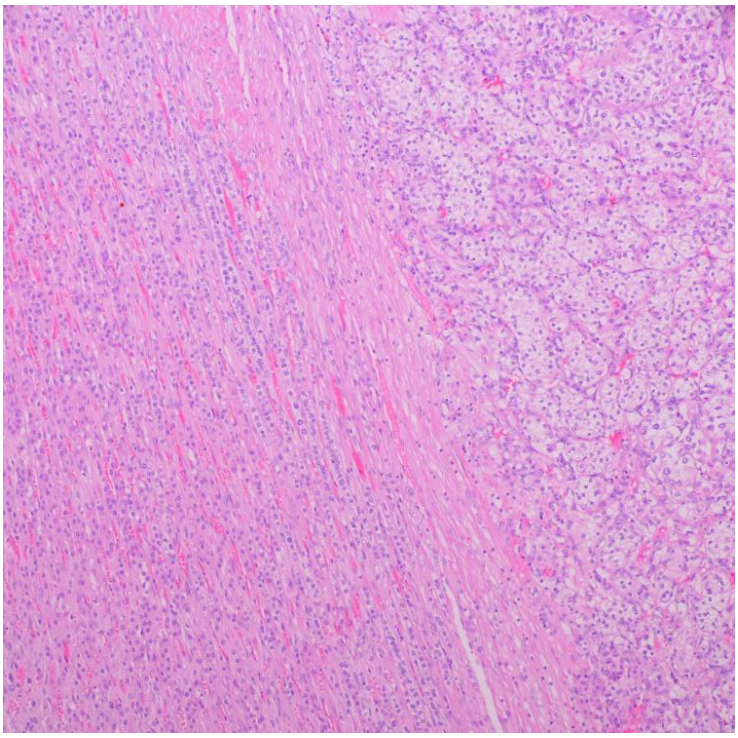
Gross Image:



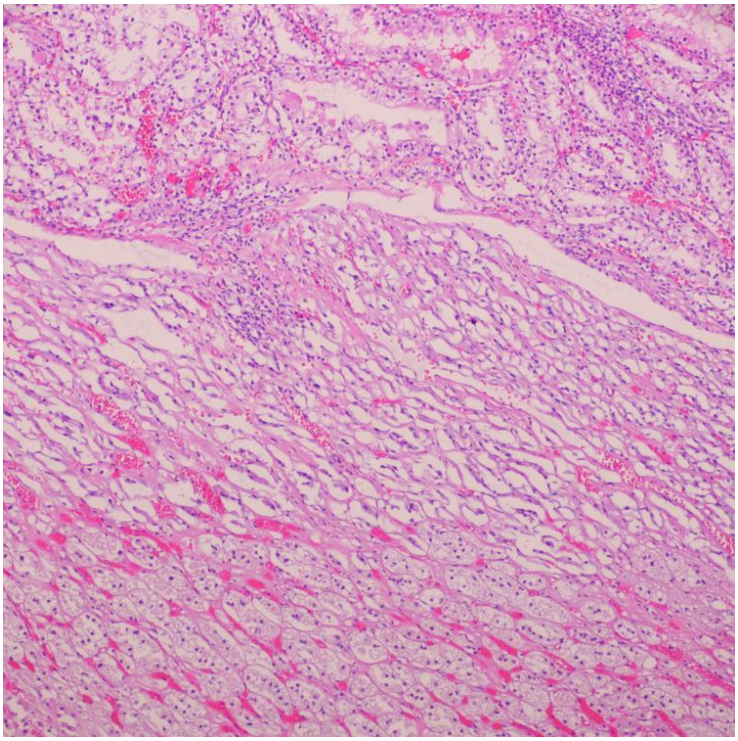


5.6 x 4.0 x 3.9 cm tan-yellow solid to cystic mass filled with tan-brown gelatinous and hemorrhagic material. The mass grossly bulges into the renal capsule and possibly invades into the overlying perinephric fat and adrenal gland.

Microscopic Images:



Adrenal-renal fusion (10x)



Invasion of clear cell renal cell carcinoma into adrenal gland with loss of capsulation (10x)

Diagnosis:

Arenal fusion with clear-cell renal cell carcinoma extending into adrenal

Discussion:

Adrenal-renal fusion is a rare congenital anomaly resulting from the failure of the retroperitoneal mesenchyme to induce the formation of separate renal and adrenal capsules. It can mimic other pathologies and is often mistaken for an ectopic adrenal gland. Several reports have documented cases in which adrenal-renal fusion was misinterpreted as either primary invasive clear-cell renal cell carcinoma or renal invasion by adrenocortical carcinoma.

Although its true incidence is unknown, adrenal-renal fusion is typically clinically insignificant when present in isolation. However, because it can resemble malignancy on both imaging and histopathology, it may lead to diagnostic confusion and unnecessary surgical intervention. When adrenal-renal fusion coexists with a true neoplasm, the potential for one to be mistaken for the other can further complicate diagnosis. While such a coexistence has not been previously reported in the literature, it presents an important diagnostic challenge.

Although adrenal tissue and low-grade renal cell carcinoma (RCC) can appear similar on hematoxylin and eosin (H&E) staining, immunohistochemical (IHC) staining helps distinguish their distinct lineages. Adrenal cortical cells typically express steroidogenic factor 1 (SF1), inhibin and MelanA, whereas RCC commonly stains positive for EMA, CAIX and PAX8. IHC is therefore essential in preventing potentially serious diagnostic errors.

Application of an immunohistochemical panel can also be helpful in distinguishing adrenal cortical lesions from metastatic CC-RCC and can offer improved diagnostic accuracy.

References:

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