functional ACCs - they do not harbor mutations of known aldosterone-producing adenoma (APA) associated genes. They present with uncontrolled hypertension and hypokalemia, as seen in this case. **Case:** 63 year old Asian female with previously well controlled hypertension experienced resistant hypertension and hypokalemia for over a year. Since the onset of hypokalemia, patient noticed worsening hypertension despite addition of multiple medications. CT abdomen during an episode of severe gastroenteritis revealed a 3.7 cm heterogenous multilobulated left adrenal mass. Hormonal workup showed elevated aldosterone of 35 ng/dl with suppressed plasma renin activity of 0.41 ng/ml/h and serum potassium of 3.4 while patient was on 50 mg of spironolactone. Plasma and urine metanephrine levels were unremarkable. Plasma ACTH was <5 ng/L, cortisol was 12 ug/dl and DHEA-S was 149 ng/dl. 24 hour urine free cortisol result was not available. Repeated CT abdomen revealed a 5.2 cm left adrenal mass (Non-contrast HU of 38, 50% absolute wash out), increasing in size from 3.7 cm in 6 months. The mass was FDG avid with SUV of 13.2. Patient underwent laparoscopic left adrenalectomy and surgical pathology revealed a 4.2 cm, high grade ACC with vascular invasion, Ki67 index of 35% and modified Weiss score of 6. Hypertension and hypokalemia resolved after tumor removal, no longer requiring antihypertensive medications. Plasma aldosterone level also remains normal after surgery. However, postoperative CT (6 weeks after surgery) revealed numerous pulmonary metastases. Germline genetic testing is pending. Genomic interrogation of the primary tumor identified CDKN2A and CDKN2B deletions, along with pathogenic mutations in CTNNB1 and DNMT3A. Copy number analysis revealed numerous large scale chromosomal alterations including many arm level and whole chromosome gains and losses. These somatic mutations affect p53/Rb1 signaling (CDKNs), chromatic remodeling (DNMT3A) and wnt signaling pathway (CTNNB1). Together with noisy pattern of copy number alterations, these genomic alterations likely account for the aggressive nature of this tumor. **Clinical Lessons:** (1) Clinicians should raise the suspicion of ACC during the workup for primary hyperaldosteronism, especially if an adrenal mass does not have the reassuring radiographic features suggestive of a benign adrenal mass. (2) Metastatic lesions may not necessarily produce aldosterone as the primary tumor does. (3) Mutational analysis of the tumor informs molecular subtypes of ACC, prognosis, and treatment decisions.

Tumor Biology

ENDOCRINE NEOPLASIA CASE REPORTS

A Case of Carney Triad Complicated by Renal Cell Carcinoma and a Germline SDHA Pathogenic Variant

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Background: Carney triad is a rare multiple-neoplasia syndrome presenting as an association of paragangliomas (PGL), gastrointestinal stromal tumors (GIST), and pulmonary chondromas (CHO). Succinate dehydrogenase deficiency has been associated with several neoplasias, including Carney triad, renal cell carcinoma (RCC) and those associated with hereditary PGL/ pheochromocytoma (PHEO) syndromes.
Clinical Case: A 57-year-old male diagnosed with hypertension at age 49, presented with a gradual increase in blood pressure over a period of 12 months. For seven years following his diagnosis of hypertension, the patient experienced episodic increases in blood pressure, to a systolic pressure greater than 180 mmHg associated with a tight band sensation around his forehead lasting half a day. Abdominal computed tomography (CT) revealed a left adrenal adenoma, a 5.1 cm para-aortic mass, and a right renal superior pole lesion measuring 2.5 cm, which was suspicious for a carcinoma. ^{123}I-metaiodobenzylguanidine (^{123}I-MIBG) and ^{18}F-fluorodeoxyglucose-positron emission tomography (^{18}F-FDG-PET) scans were performed, which suggested the para-aortic mass to be consistent with a PGL. Additionally, ^{18}F-FDG uptake was noted in the gastroesophageal region and was suspicious for a GIST. The left adrenal mass was not associated with ^{123}I-MIBG or ^{18}F-FDG activity. Chest CT demonstrated a right middle lobe lung lesion suggestive of a CHO, although no biopsy was performed. A diagnosis of Carney triad was made. The patient underwent surgical resection of the PGL and GIST, as well as a partial right nephrectomy. The PGL and GIST were positive for SDHA and negative for SDHB by immunohistochemical (IHC) staining. Pathology from the renal lesion was consistent with a 2.3 cm conventional clear cell renal carcinoma, with positive staining for SDHA and SDHB by IHC. The patient was found to harbor a germline heterozygous pathogenic variant (c.91 C>T, p.R31X) in *SDHA* which has been previously reported and results in loss of function of SDHA. *SHDC* hypermethylation was not detected in the PGL, GIST, or RCC. Additionally, DNA sequencing of the RCC did not indicate loss of heterozygosity at the variant region of interest. Although the *SDHA* disease-causing variant is responsible for the patients Carney triad phenotype, it is unclear if this variant is causative of the RCC.
Conclusion: This is a novel presentation of a germline inactivating *SDHA* pathogenic variant in a patient with Carney triad complicated by RCC. However, an *SDHA* disease-causing variant was previously reported in a patient with comorbid GIST and RCC. This case provides further support to the increasing evidence that *SDHx* pathogenic variants may predispose patients to develop renal neoplasms.

Tumor Biology

ENDOCRINE NEOPLASIA CASE REPORTS

A Case of Improvement of Insulinoma Symptoms in Pregnancy