A 33-yr-old man was referred for hypertensive crisis at the age of 28 years with a family history of hypertension and hypokalemia. Renal function was normal. ACTH levels were normal. Cortisol after dexamethasone suppression test was elevated, and ACTH and DHEAS were low, raising suspicion of Cushing’s syndrome. He had right adrenal, measuring 5.5 cm with pre-contrast density of 30 HU and absolute wash-out of 77%. After laparoscopic right adrenalectomy, histologic examination revealed an encapsulated tumor with glomerulosa-like cells predominance and a Weiss score 2 (clear cells < 25% and > 1/3 diffuse architecture). CYP11B2 staining was positive in 30% and Ki67 in 5% of the cells. She presented biochemical cure of PA and improvement in HT control. Genetic investigation for somatic KCNJ5, ATP1A1, ATP2B3 and CTNNB1 was negative in both cases.

Conclusion: We describe two rare cases of APAs that presented as large and suspicious tumors, without somatic mutations in genes associated with APAs.

Adrenal

ADRENAL CASE REPORTS II

A Case of Metastatic Merkel Cell Carcinoma Within a Cortisol-Producing Adrenal Adenoma

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SUN-181

Introduction:
Metastasis within another tumor is rare, and exceedingly more rare within a functional adrenal adenoma. Merkel cell carcinoma (MCC) is an aggressive and rare neuroendocrine carcinoma of the skin. We present a patient with history of MCC who presented with an adrenal mass, found to be metastatic MCC within a cortisol-producing adrenal adenoma.

Case description:
54 year old male with a history of type 2 diabetes, hypertension, MCC of right thigh, presented for adrenal mass. He was initially evaluated in the ER for severe abdominal pain for 4 days. He had a CT abdomen done, which showed 6cm right adrenal mass with extensive fat and soft tissue component within it. Hounsfield units within solid area measured up to 47 units, and surrounding area measured -3 Hounsfield units.

His history was significant for MCC of right thigh, type 2 diabetes, HTN, obesity and OSA. Pathology from MCC resection showed no evidence of invasion and clear margins, but he did have microscopic focus on inguinal lymph node biopsy. His PET scan was negative except for low uptake in a 6cm right adrenal lesion that was considered benign-appearing. He completed radiation therapy to right thigh and groin.

Physical exam was notably negative for any cushingoid features. Aldosterone, renin and plasma metanephrines were normal. Cortisol after dexamethasone suppression test was elevated, and ACTH and DHEAS were low, raising suspicion of Cushing’s syndrome. He had right adrenalectomy and was then started on steroid replacement. Pathology showed adrenocortical adenoma with a 2cm well-circumscribed mass within the adenoma positive for metastatic MCC with lymphovascular invasion. ACTH stimulation testing was performed at follow up after holding hydrocortisone for over 24 hours, and was consistent with suppression of glucocorticoid axis in the contralateral adrenal gland.

Discussion:
MCC and metastasis within a functional adrenal tumor are both rare occurrences. Our patient had positive regional lymph node involvement at the time of diagnosis, and although the initial PET scan was interpreted as showing an benign adrenal adenoma, it is likely that this represented distant metastasis. Labs indicated that the surrounding adenoma was likely cortisol-producing. To our knowledge,
this is the first case reported of metastatic MCC within a functional adrenal adenoma.

References:
Baek, SH, et al. “Merkel cell carcinoma of the Axilla and Adrenal Gland: A Case Report with Imaging and Pathologic Findings.” Case Reports in Medicine. Volume 2015, Article ID 931238.
Dongyan, L, S. Kumar. “An exceedingly rare adrenal col- lision tumor: adrenal adenoma-metastatic breast cancer- myelolipoma.” Journal of Community Hospital Internal Medicine Perspectives, 2017, Vol. 7, No. 4, 241-244.
Martin, JT, et al. “Metastatic adenocarcinoma within a functioning adrenal adenoma: a case report.” Cases Journal 2009, 2:7965.

Tumor Biology
TUMOR BIOLOGY: GENERAL, TUMORIGENESIS, PROGRESSION, AND METASTASIS
Glycoprotein NMB (GPNMB) Is Pro-Tumorigenic in TSC2-Null Cancer Cells and Is a Potential Drug Target and Biomarker for Lymphangioleiomyomatosis (LAM).
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SAT-141
Glycoprotein NMB (GPNMB) is Pro-Tumorigenic in TSC2-Null Cancer Cells and is a Potential Drug Target and Biomarker for Lymphangioleiomyomatosis (LAM). Lymphangioleiomyomatosis (LAM) is an estrogen-sensitive lung disease found almost exclusively in women that is characterized by hyperproliferation of smooth muscle cells forming small tumors, or LAM lesions throughout the lungs of patients. Growth of these tumors leads to progressive loss of pulmonary function, and sometimes subsequent lung transplantation. LAM tumor cells contain mutations in either the TSC1 or TSC2 genes, leading to activation of the mTORC1 pathway. In fact, mTOR inhibitors such as sirolimus are commonly used to treat LAM; however, these drugs are not always effective and have significant side effects, suggesting the need for new therapeutic targets. Interestingly, another important feature of LAM cells is that they express melanocytic markers that are normally found in melanocytes or melanoma cells. From RNAseq analysis of a mouse model for LAM that we designed, we discovered significant upregulation of the melanocytic marker Glycoprotein Non-Metastatic Melanoma Protein B (GPNMB), a type I transmembrane protein. GPNMB was not only highly expressed in our mouse model (a uterine specific TSC2-null mouse), it was also expressed in TSC2-null cell lines, and human LAM patient lung samples. In our hands, knocking down GPNMB expression by siRNA directed against GPNMB mRNA decreased migration and proliferation in TSC2-null cells. Additionally, we found that GPNMB’s large ectodomain is shed by TSC2-null cells and can be detected in the blood of human patients with LAM. Finally, MMP 2 and 9 can be secreted as a result of ectodomain shedding and its interaction with integrins. Accordingly, we did indeed see a decrease in MMP 2/9 expression from treatment with siRNA directed against GPNMB mRNA. Overall, our results demonstrate the potential importance of GPNMB in LAM tumor progression, and suggest that GPNMB may be a possible LAM biomarker and target for its treatment.

Diabetes Mellitus and Glucose Metabolism
DIABETES TECHNOLOGY
Comparison of the Accuracy and Concordance of 3 CGM Devices vs SMBG During Aerobic Exercise
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SAT-649
Introduction: Real-time continuous glucose monitoring (rt-CGM) and flash glucose monitoring (FGM) devices have become important tools for managing type 1 diabetes. These devices are approved for management decisions in steady-state conditions, however there is a decline in accuracy during aerobic exercise with respect to MARD and lag time. It is possible that newer technologies may be superior to previous devices.

Question: With the newest rtCGM, FGM, and long-term CGM devices, do we continue to see an increase in MARD during continuous aerobic exercise? Is there a difference between glucose readings of the 3 devices when worn simultaneously during exercise?

Design: A single subject with T1DM, experienced in glucose management during exercise, wore 3 devices simultaneously - the DEXCOM G6 (San Diego, CA; rt-CGM1, worn on the abdomen), the Eversense (Germantown, MD; long-term CGM or rt-CGM2, implanted in the left arm), and the Abbott Freestyle Libre 14-day (Chicago, IL; FGM, worn on the right arm). The rt-CGM2 was calibrated using a blood glucose meter (Ascensia Contour Next) which was also used for comparator SMBG. Glucose was recorded 10 minutes before and after exercise and every 10 minutes during a 60 minute run at moderate intensity. 6 exercise sessions were averaged for data analysis. Subject wore an insulin pump and reduced the basal rate by 50% 90 minutes prior to exercise and resumed the basal immediately post-exercise. Carbohydrates were not used within 3 hours prior to exercise but could be consumed during exercise if needed to avoid hypoglycemia.

Results: Glucose value during 60 minutes of exercise dropped from mean of 167 to 114 mg/dL with SMBG, 174 to 115 mg/dL with rt-CGM, 175 to 115 with rt-CGM2, and 150 to 106 mg/dL with FGM. Average measured glucose was 140.0, 145.8, 145.6, and 129.3 mg/dL for SMBG, rt-CGM1, rt-CGM2, and FGM respectively. P-value <0.05 for FGM. MARD (calculated compared to SMBG) for 10 minutes pre-exercise, during exercise, and post-exercise for rt-CGM1 was 5.1%, 11.7%, and 8.6% respectively. For rt-CGM2 MARD was 7.7%, 11.4%, and 10.0% respectively. For FGM, MARD was 12.7%, 5.3%, and 21.3% respectively. Overall MARD was 9.8% for rt-CGM1, 10% for rt-CGM2, and 8.0% for FGM.

Conclusions: Blood glucose values dropped with aerobic exercise with observed lag between CGM and SMBG.