to TUMC and his evaluation revealed a large right adrenal mass (17x11cm) with multiple liver and lung lesions suggestive of metastatic cancer. The adrenal mass was needle biopsied and pathology results were diagnostic of adrenal cortical carcinoma.

His baseline morning cortisol level was 22.45 mcg/dL, ACTH 13.2 (n=7.2-63.3), androstenedione 291 ng/dL (n=27-152), 17-hydroxy progesterone 10,850 ng/dL (n=27-199), testosterone 140 mg/dL, renin 1.295 mg/ml/h (n=0.167-5.38), aldosterone unable to assay due to interference and LDH 2011 U/L (n=87-241). He failed an overnight 1mg dexamethasone suppression test with cortisol of 20.17 in the morning. During hospitalization, his clinical condition gradually deteriorated with hypotension, altered mental status, acute respiratory failure and acute liver failure with an AST 2787 units/L (n<39), ALT 399 (n=30-65) and ALP 1013 units/L (n=40-120). Oncology decided that the patient was a poor candidate for antineoplastic treatment therefore he was offered hospice care and eventually expired.

Discussion:
There have been reports of benign and malignant adrenal tumors in patients with CAH. It has been surmised that ACTH is the driver of adrenal tumor transformation in these patients. Our patient with adrenocortical carcinoma presented at a late stage with widespread metastases resulting in death. His elevated cortisol level occurred in association with low normal ACTH and the failed 1mg overnight dexamethasone suppression test are consistent with tumor production of cortisone. Considering that he had untreated CAH since childhood, we assume elevated ACTH levels were present until tumor transformation occurred.

Tumor Biology
TUMOR BIOLOGY: GENERAL, TUMORIGENESIS, PROGRESSION, AND METASTASIS
Postmenopausal Virilization: Rare Case of an Ovarian Tumor Not Easily Identified on Imaging
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SAT-134
Postmenopausal virilization: rare case of an ovarian tumor not easily identified on imaging
Introduction:
Ovarian sex cord-stromal tumors are a rare type of ovarian tumor which can be benign or malignant. Steroid cell tumors are a subtype of these tumors, representing <0.1% of all ovarian neoplasms (1). Here, we present the case of a 58 year old post-menopausal female who presented with virilization in the setting of bilateral adrenal adenomas & pelvic ultrasound without a definitive mass.
Case Report:
A 58 year old post-menopausal white female presented with deepening of voice, male pattern hair loss, increased muscle mass, weight gain, clitoromegaly, acne, increased axillary & facial hair growth. This had occurred over a period of 1.5 years. Initial investigatory labs revealed markedly elevated testosterone level of 630 ng/dL (n 2-45ng/dL). Normal FSH/LH, morning ACTH and cortisol, DHEAS, 17 OHP, androstenedione, prolactin and IGF1. Exogenous intake of testosterone was excluded. A transf vaginal ultrasound showed thickened and cystic endometrial lining but no cysts or masses in the ovaries. An endometrial biopsy was normal. In the absence of a definitive source of elevated androgens, CT abdomen pelvis was done & showed remarkable for bilateral adrenal adenomas. Serum metanephrines were normal. An overnight dexamethasone suppression test was abnormal; morning cortisol level 3.1 (n 4.0-22.0). With a normal DHEAS these adenomas were considered to be the less likely etiology of her virilization. Given concern for an ovarian malignancy, a hysterectomy was recommended.

Her total testosterone level right before surgery was 954 ng/dL. Post-operatively, not only did the total testosterone levels drastically fall to 18 ng/dL merely on POD 4, but the patient reported new scalp hair growth, decreased abdominal girth & skin smoothing. Her surgical pathology was with that of a steroid tumor of the ovary.

Conclusion
Steroid cell tumors of the ovary can be benign or malignant. A prompt diagnosis is critical. In the presence of elevated testosterone levels or virilizing symptoms, an ovarian etiology must be suspected. Given the malignant potential of these tumors, if there is clinical suspicion, an expedited total hysterectomy and bilateral salpingo-oophorectomy is recommended. The objective of surgical treatment is to relieve symptoms and for staging in the case of malignancy.

Timely management of the tumor can reduce metastasis and significantly improve quality of life, as seen in our case.

References
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Reproductive Endocrinology

OVARIAN FUNCTION — FROM OLIGOMENORRHEA TO AMENORRHEA

Increased Caloric Intake Improves Regularity of Menses and Is Associated with Increased TT, and Leptin in Exercising Women with Oligo/amenorrhea: The “REFUEL” Randomized Controlled Trial

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Exercising women often fail to consume adequate energy intake relative to energy expenditure and are thus susceptible to menstrual disturbances and poor bone health secondary to energy deficiency. Ideal treatment plans are to increase energy intake to reverse energetic suppression. The purpose of this study was to determine if REFUEL, a 12-month randomized controlled trial (RCT) of increased energy intake, improves menstrual frequency and markers of energetic status in exercising women with oligo/amenorrhea. Young, exercising women with oligo/amenorrhea were randomized into two groups. The treatment group (Oligo/Amen+Cal, n=32) increased energy intake 20-40% above baseline energy needs and the Oligo/Amen Control group (n=30) maintained exercise and eating habits for the 12-month intervention. Menses was tracked throughout the intervention by menstrual calendars and daily urine samples, energetic status was assessed by body composition and total triiodothyronine (TT₃) and leptin concentrations. Conditional recurrent events Cox Proportional Hazards model tested the effects of the intervention and multi-level modelling assessed relationships among variables. There was a significant group*time interaction for body mass, percent body fat, fat mass, and TT, concentrations (p<0.03), such that Oligo/Amen+Cal women gained more body mass and fat mass and had a greater increase in TT, during the study compared to Oligo/Amen Controls. Specifically, Oligo/Amen+Cal women (21.6 yrs, BMI: 20.2 kg/m²) increased energy intake by 353 kcal/d and gained 1.9 kg of body mass, corresponding to increased fat mass (1.2 kg) and leptin (64%). Oligo/Amen Controls (20.9 yrs, BMI: 21.3 kg/m²) had no change (-32 kcal/d) in energy intake (p<0.001 vs. Oligo/Amen+Cal) and minimal change in body mass (0.8 kg; p=0.04 vs. Oligo/Amen+Cal), fat mass (0.4 kg; p=0.08 vs. Oligo/Amen+Cal), and leptin (21% increase, p=0.07 vs. Oligo/Amen+Cal). Controlling for baseline BMI and menstrual status, the intervention increased the likelihood of experiencing menses (p<0.001) such that Oligo/Amen+Cal women were twice as likely (104% increase) to experience menses during the intervention compared to Oligo/Amen Controls. Further, the higher the BMI at baseline, the greater the likelihood of experiencing a menses such that for every kg/m² increase in BMI the likelihood of menses increased by 10%. Overall, a nutritional intervention designed to increase energy intake by a moderate amount in exercising women with oligo/amenorrhea successfully improved body mass and fat mass, concentrations of metabolic hormones, and the likelihood of experiencing menses compared to oligo/amenorrheic women who maintained exercise and eating habits. As such, treatment plans designed to increase energy intake can be successful in reversing energetic suppression and recovering menses.

Pediatric Endocrinology

PEDIATRIC PUBERTY, TRANSGENDER HEALTH, AND GENERAL ENDOCRINE

Prenatal and Post-Natal Influence of Androgens in the Psychosexual Development in Individuals with 21-hydroxylase Congenital Adrenal Hyperplasia

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Introduction: Congenital Adrenal Hyperplasia (CAH) is defined as a group of autosomal recessive disorders characterized by a deficiency of the enzyme required to synthesize cortisol by the adrenal cortex. Defects in the 21-hydroxylase enzyme make up of 90% of CAH. It is caused by several mutations in the CYP21A2 gene. These defects impaired cortisol synthesis leading to an ACTH increase resulting in androgen excess, either with salt-wasting or simple virilizing forms. Androgens play a crucial

47.4 months (IQR 10.8 to 93.7). Most were female (64.3%). The mean age at diagnosis was 46.3 ± 14.48 years. The most frequent insulinomas (59.5%), followed by (12.7%) carcinoid tumors, gastrinomas (11.1%), ACTomas (10.3%), VIPomas (2.4%) glucagonomas (2.4%) and PPomas (1.6%). Nineteen subjects (15.1%) had genetic syndromes, mainly MEN1 (89.5%); and 8.7% had other neoplasms, most frequently non-functional gastrointestinal (GI) carcinoids (36.3%) and thyroid cancer (18.8%). The median duration of symptoms prior to diagnosis was 24 months (IQR 7.75 to 48). The most common locations were, the GI tract (86.5%), whereas 7.1% were outside the GI tract and 6.4% were of unknown primary origin. Functional NETs outside GI tract were localized primarily in lungs (66.6%). Functional pancreatic NETs occurred more commonly in the tail (39.6%). 24.6% had locoregional or distant metastasis during follow-up. The most frequent metastatic sites were liver (86.5%), regional lymph nodes (59.8%) and bone (13.5%). The most common treatment was surgery (87.3%, with 13.6% ≥2), followed by 18.3% somatostatin receptor analogues and 11.1% cytotoxic chemotherapy. Most subjects (73%) had complete remission with first line therapy, but 14.1% had recurrence at a median of 50.7 months (IQR 15.4 to 97.6). Subjects with an incomplete remission progressed after a median of 14.85 months (IQR 10 to 38.9). Conclusions: The clinical characteristics of functional NET treated at a tertiary center in Mexico are similar to those in other population and geographic locations described in the literature.