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CONNed Out of a Diagnosis: A Case of an Ectopic ACTH-Secreting Tumor

Taylor Goot, MD; Justin Miller, MD; Tasha Serna-Gallegos, MSIV; Charles Pizanis, MD

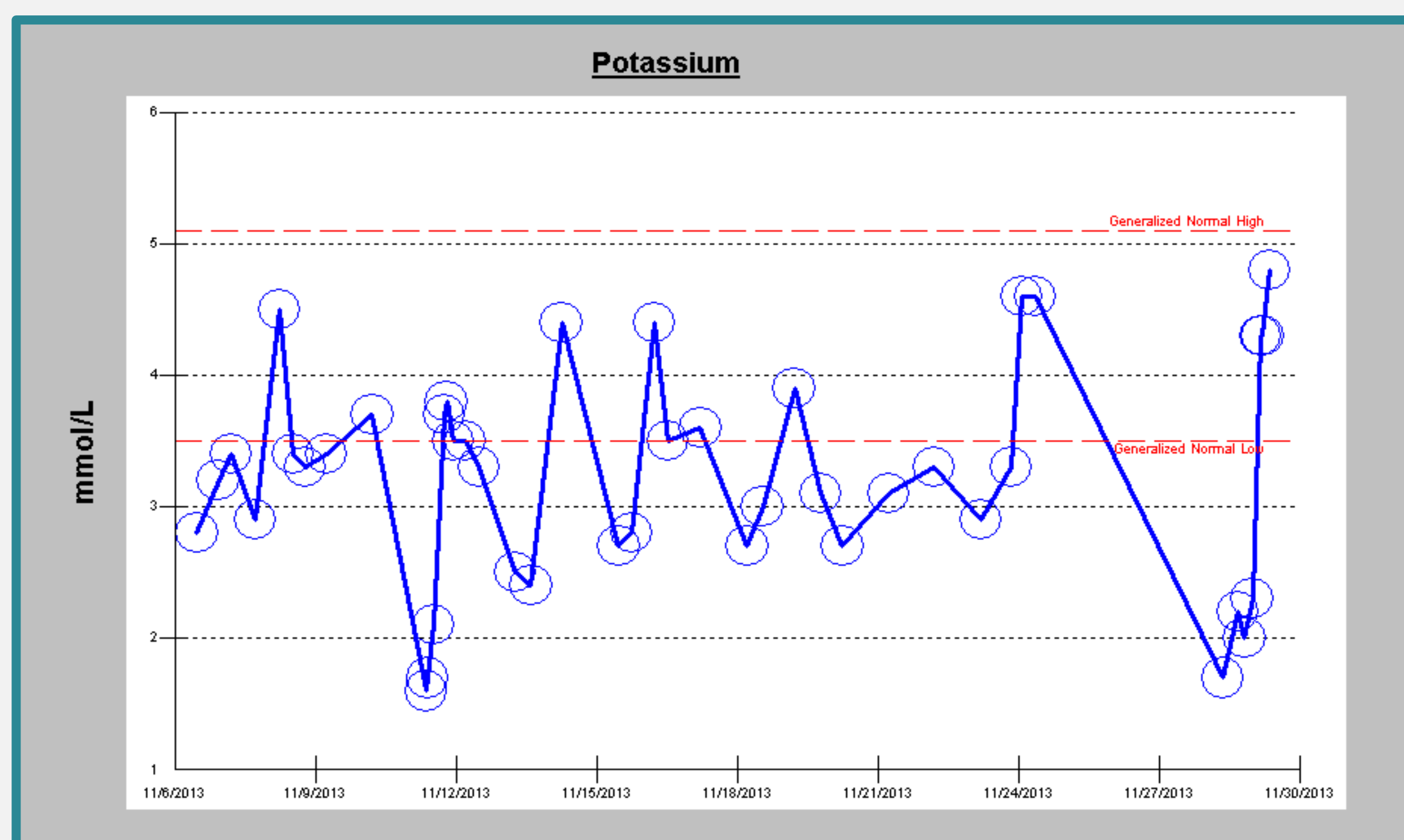
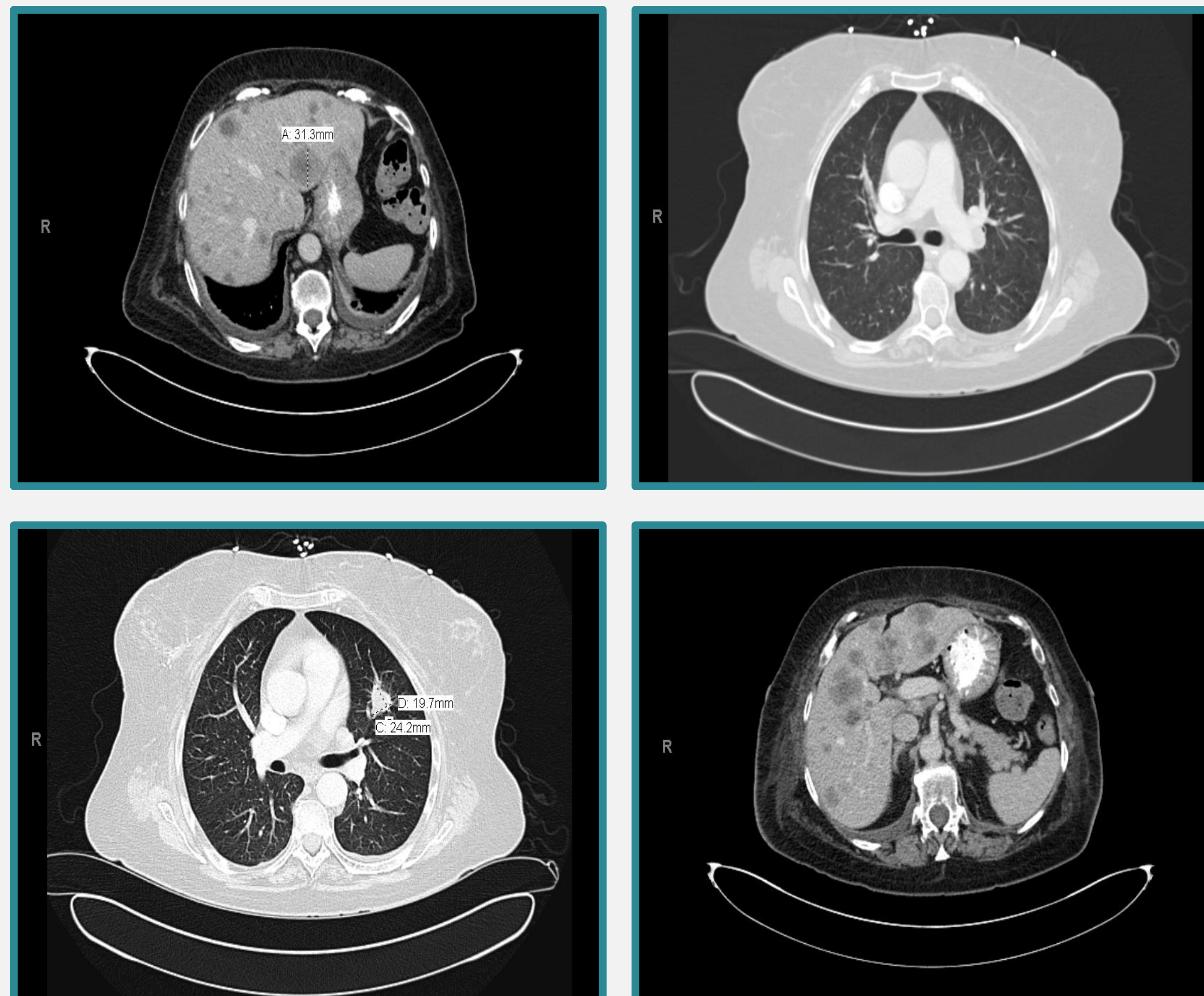
Background

Ectopic ACTH-secreting tumors represent a rare clinical entity which can cause a secondary Cushing's syndrome. These hormone-secreting tumors can result in a syndrome that shares many clinical features of primary hyperaldosteronism (Conn's syndrome), and typically require a high degree of clinical suspicion for diagnosis.

Case

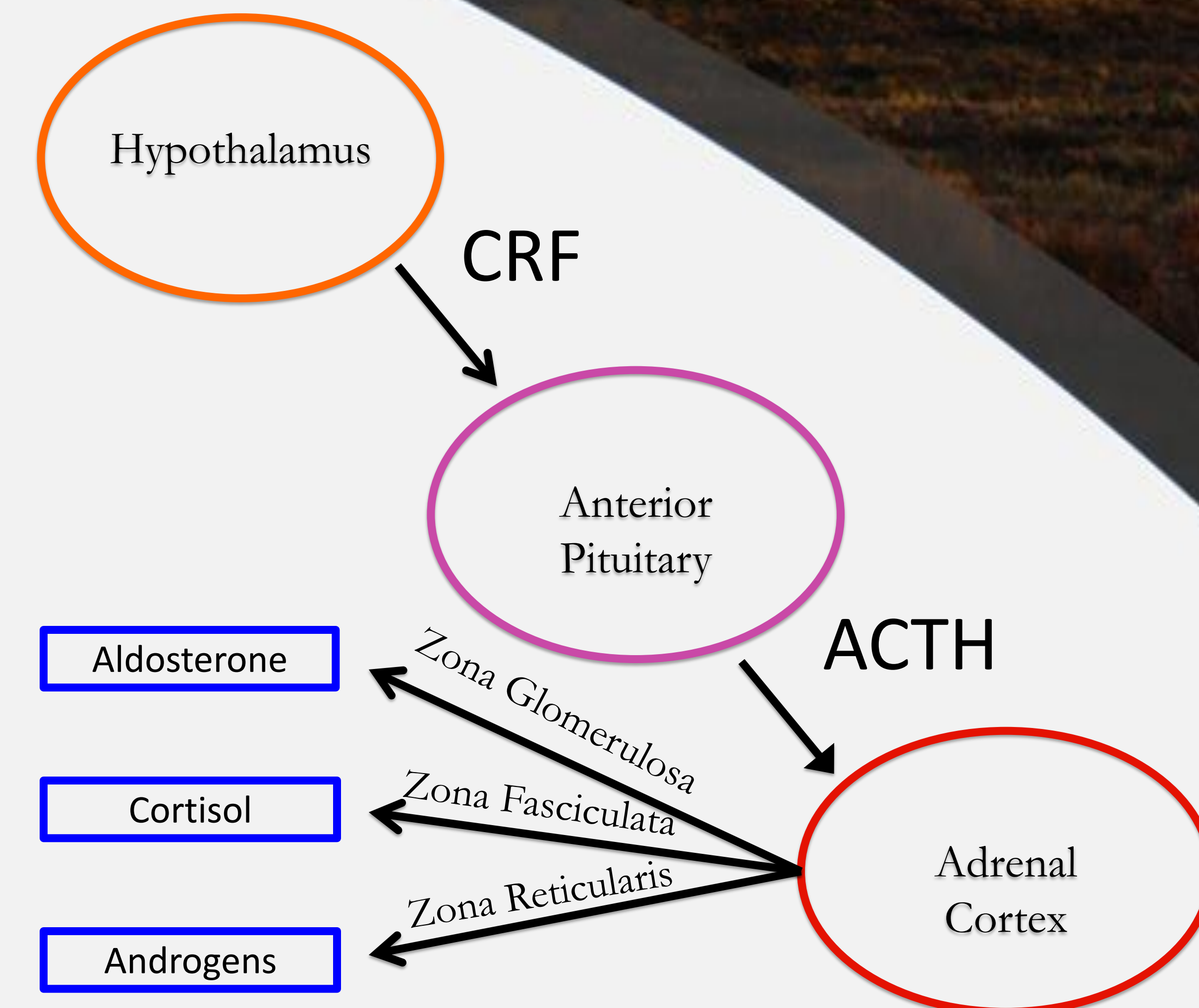
A 72-year-old female with a past medical history significant for hypertension, non-insulin dependent diabetes mellitus, and tobacco use was referred to the University of New Mexico Hospital from her rural primary care provider for severe refractory hypokalemia. The patient was asymptomatic other than mild lower extremity edema that had been present for the past week and constipation over the last 2.5 weeks. The patient had been treated during this time with increasing doses of laxatives and oral potassium. Failing this treatment with an outpatient potassium level of 2.8 mmol/L and continued constipation, the patient was referred for inpatient evaluation. Upon presentation, the patient's labs included a potassium of 2.8mmol/L and bicarbonate of 31mg/dL, as well as hyperglycemia, leukocytosis and evidence of a urinary tract infection. Blood pressures ranged from 160-186/79-83mmHg. Initial physical exam was notable only for lower extremity edema. Initial treatment was focused on aggressive potassium replacement and treatment of the patient's infection.

Due to the persistent hypertension and hypokalemia, renin and aldosterone levels were obtained which were 0.1ng/dL and 7.9ng/dL respectively, not suggestive of hyperaldosteronism. Follow up physical exam found a palpable abdominal mass prompting an abdominal CT scan, which showed colonic thickening and innumerable liver masses. Colonoscopy was grossly normal. Further history obtained suggested that the in-hospital hyperglycemia and hypertension were inconsistent with the patient's recent outpatient history. 24-hour urine cortisol was obtained which was markedly elevated. An overnight dexamethasone suppression test was performed, with pre-suppression ACTH levels of 460pg/mL and post-suppression levels of 441pg/mL. A liver biopsy showed pathology consistent with small cell carcinoma which further raised suspicion for a paraneoplastic syndrome. The patient was diagnosed with Cushing's syndrome caused by ectopic ACTH secretion and hyperaldosteronism-like hypokalemia with hypertension and alkalosis. A chest CT would later reveal the primary lung tumor. The patient unfortunately succumbed to her disease soon after diagnosis.



References

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Review of HPA Axis

Hormones secreted by the anterior lobe of the pituitary include TSH, FSH, LH, ACTH, growth hormone, and prolactin. ADH and oxytocin are secreted by the posterior lobe of the pituitary. ACTH stimulates the first step in the synthesis of mineralocorticoids, glucocorticoids, and adrenal androgens, which is the conversion of cholesterol to pregnenolone. Mineralocorticoids stimulate sodium reabsorption and potassium secretion by the kidneys. Conn's syndrome is a clinical diagnosis reflecting an overproduction of mineralocorticoids, while Addison's disease is a primary adrenocortical deficiency. Glucocorticoids stimulate gluconeogenesis while also providing an antiinflammatory and immunosuppressive effect. Cushing syndrome, therefore, is an overproduction of glucocorticoids.

Conclusion

We present a case of an ACTH-secreting pulmonary tumor with a secondary Cushing's syndrome and hyperaldosteronism-like state. Being that the patient's chief complaint was constipation, diagnosis was delayed until we achieved a full clinical picture. Our case represents the need for a high index of suspicion and global consideration of a patient's signs and symptoms, as well as a presentation of a rare entity with a common chief complaint.