was 129 mmol/L, and was treated with 2.5L IV 0.9% saline. Home immunosuppression with cyclosporine, azathioprine and prednisone 5 mg/d were continued. Sodium declined to 126 mmol/L on day 4 prompting endocrine consult. Labs prior to fluid administration were consistent with iso-osmolar hyponatremia: sOsm 283 mOsm/kg and uOsm 409 mOsm/kg. Pseudohyponatremia was suspected and electrophoresis and immunofixation revealed a free kappa light chain gammopathy. Evaluation when sodium was 126 mmol/L was now consistent with hypotonic hyponatremia: sOsm 273 mOsm/kg, uOsm 398 mOsm/kg, and urine sodium 56mmol/L. TSH was normal and AM cortisol was 11.9 ug/dL (3.7–19.4 ug/dL), drawn while on maintenance prednisone. Lab findings and improvement of abdominal pain after receiving high dose prednisone for CT contrast-allergy prophylaxis raised our suspicion for SIADH and undertreated secondary AI. Retrospective chart review revealed tacrolimus use after lung transplant before its discontinuation 9 months prior to admission. Chronic hyponatremia was noted a few months post lung transplantation, with a nadir of 120 mmol/L and only mild improvement despite tacrolimus discontinuation and empiric fludrocortisone use. The patient was treated with a 1L fluid restriction, doubling of prednisone to 10 mg/d and cessation of fludrocortisone for lack of concern for primary. Abdominal symptoms resolved, mental status improved, and serum sodium rose to 132 mmol/L over the next few days, later normalizing to 135–140 mmol/L on follow up. The patient was eventually diagnosed with Waldenström macroglobulinemia.

**Conclusion:** Hyponatremia in lung transplant recipients can be multifactorial. Calcineurin inhibitors and steroids are part of typical immunosuppressive regimens and can lead to hyponatremia through salt wasting nephropathy or SIADH(1), and undertreated secondary AI, respectively. Posttransplant lymphoproliferative disorders occur in up to 9% of cases(2) and must be suspected as an etiology of hyponatremia.

**References:** 1.Cowan AJ, Johnson CK, Libby EN. Plasma cell diseases and organ transplant: A comprehensive review. Am J Transplant. 2018;18(5):1046–58.2.Aris RM, Maia DM, Neuringer IP, Gott K, Kiley S, Gertis K, et al. Post-transplantation lymphoproliferative disorder in the Epstein-Barr virus-naïve lung transplant recipient. Am J Respir Crit Care Med. 1996;154(6 Pt 1):1712–7.

# Adrenal

## ADRENAL CASE REPORTS

### *Multiple Challenges: An Unusual Case of an Adrenal Mass With Plurihormonal Secretion of Catecholamines and Cortisol in a Patient With Several Neoplasms*

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**Introduction:** Simultaneous hypersecretion of both catecholamines and cortisol in one adrenal tumor is rarely seen because cortical cells, which produce cortisol, and medullary cells, which secrete catecholamines, are derived from different germ layers[1]. Formidable challenges ensue from a tumor with a complex behavior. We demonstrate here the clinical course and multi-modal management of the case of an adrenocortical adenoma which had neuroendocrine differentiation accounting for the excess of both catecholamine and cortisol hormones in a patient with multiple neoplasms.

**Clinical Case:** An adrenal mass was incidentally discovered in a 61-year old female undergoing imaging as part of the metastatic work-up for an esophageal mass. The patient has insulin-requiring diabetes mellitus, hypertension and a history of breast cancer. A right adrenal gland mass, avidly enhancing, measuring 3.8 x 2.7 x 2.7 cm was found on abdominal imaging. The 24-hour urine metanephrine collections were done, and these were more than twice elevated in two instances at 2.516 mg/24 hours and 2.101 mg/24 hours (NV: 0–1 mg/24 hours). An unsuppressed cortisol level at 6.57 µg/dL (NV: ≤ 1.8 µg/dL) was obtained after the 1 mg dexamethasone suppression test. Hypercortisolism was confirmed with an elevated 24-hour urine free cortisol at 312.07 µg/24 hours (NV: 20–90 µg/24 hours). Adrenocorticotrophic hormone (ACTH) was low at 0.90 pg/ml, indicative of the presence of an adrenal form of Cushing's. Primary aldosteronism was ruled out based on a ratio between plasma aldosterone concentration and plasma renin activity of less than 20.

Pre-operative alpha blockade with terazosin was initiated. Right adrenalectomy was done. Histopathology revealed an adrenal mass of cortical origin, atypically staining positively for synaptophysin, which is indicative of neuroendocrine differentiation of the tumor. The patient had better blood pressure and glycemic control after the adrenalectomy.

**Clinical Lessons:** An adrenocortical adenoma very seldom undergoes neuroendocrine differentiation. Pathophysiologic mechanisms include a genetic aberration in cortical cells leading to production of catecholamines[2]. This case underscores the importance of a comprehensive biochemical evaluation of a patient with an adrenal mass because control of hormonal hypersecretion is essential in reducing cardiovascular risks, morbidity and mortality.

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# Adrenal

## ADRENAL CASE REPORTS

### *Nephrotic Syndrome Following Resection of an Adrenal Incidentaloma:A Case Report*

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A 69 year old man had a 5 cm right adrenal lesion discovered incidentally while being investigated for a deterioration in previously well-controlled hypertension. Routine investigations including serum albumin were normal. Further investigation confirmed a non-functioning adrenal lesion. MRI revealed a 'non-fat-containing T1 hyperintense indeterminate adrenal lesion with speckling of T2 hyperintensity, not typical for adenoma, hyperplasia, myelolipoma, haemangioma or pheochromocytoma'. An uncomplicated laparoscopic adrenalectomy was performed. Histology revealed a 118 g adrenal neoplasm, modified Weiss score 0, with abundant hyaline deposits.3 months later the patient complained of peripheral oedema. Investigations revealed a serum albumin of 24 g/L and 14 g of proteinuria in 24 hours. Serum protein electrophoresis revealed a monoclonal IgA type lambda band. Renal biopsy revealed amorphous material displaying apple green birefringence on staining with Congo Red, which stained with antibodies to lambda light chains, confirming AL amyloid. Therefore the patient's resected adrenal specimen was retrieved and stained with Congo Red, revealing apple green birefringence in the walls of the blood vessels, confirming the presence of amyloidosis. Although adrenal gland involvement in secondary amyloidosis is common, adrenal involvement in primary amyloidosis is less well described. This case illustrates the indolent nature of primary amyloidosis, prior to the development of often catastrophic symptoms. Consideration should be given to Congo Red staining of resected pathologic specimens containing hyaline deposition, to potentially allow for earlier recognition of this devastating disease. A pathophysiologic link between the patient's incidentaloma, adrenalectomy, and onset of nephrotic syndrome remains a matter for conjecture.

# Adrenal

## ADRENAL CASE REPORTS

### *Nivolumab Induced Multiple Endocrinopathies; Adrenal Insufficiency and Primary Hypothyroidism in a Patient With Stage IV Gastric Cancer - A Case Report*

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**Introduction:** Nivolumab is a revolutionary immune check point inhibitor (ICI) that changed the world of oncology. It prevents interaction of Program Death Receptor-1 (PD-1) and Program Death Ligand-1 (PD-L1) releasing a cascade of anti-tumor response. However, it has been associated with wide range of autoimmune side effects including gastrointestinal, hepatic, and endocrine side effects. The incidence of nivolumab induced endocrinopathies is relatively rare but increasingly reported. Adrenal insufficiency occurring in <1% of patients, hyperthyroidism in 15.3% and subclinical hypothyroidism in 4.2%. **Case Presentations:** 81 year old male with stage IV stomach cancer treated with Nivolumab. Prior to immunotherapy initiation, a set of baseline hormones was obtained and was within normal range. 6 months after, routine monitoring showed elevated thyroid stimulating hormone 6.33 mU/L and low FT4 0.59 ng/dL and FT3 0.1 ng/dL. Patient was started on thyroid replacement therapy. After 1 year of Nivolumab therapy, he presented with dizziness and orthostatic hypotension. Laboratory testing was remarkable for low sodium 130 mEq/L, which raised concerns for adrenal insufficiency. Subsequently, ACTH stimulation test showed low cortisol level 15 mcg/dL. Morning cortisol was also low 1.3 mcg/dL. Other pituitary hormones were normal. Patient was started on hydrocortisone with subsequent improvement of symptoms. **Discussion:** Nivolumab is a human monoclonal antibody that blocks PD-1 and turns off the tumor mediated immune system inhibition. In the meanwhile, ICI also disrupt normal immune signaling mechanisms that lead to decrease immune tolerance and autoimmune diseases. The mechanism of thyroid dysfunction due to ICI remains unclear. PD-1/PD-L1 blockade could induce thyroiditis by diminishing regulatory T cells function. Disruption of interaction between PD-1-expressing lymphocytes and PD-L-expressing thyrocytes –which protects the thyroid gland from autoimmunity– leads to infiltration of the thyroid with autoreactive T and B lymphocytes. Nivolumab induced Adrenal insufficiency is an extremely rare and unclear event, currently, there is no clear evidence that pituitary cells express PD-1. Recently, it was found that the PD-L1 and PD-L2 are expressed in mouse anterior and intermediate pituitary gland, but not the posterior pituitary. This suggests the possibility that specific injury can take place affecting only certain anterior pituitary cells, such as those producing ACTH. Awareness of such endocrinopathies is crucial. Patients should have certain baseline of laboratory data prior to therapy initiation and over the course of treatment. The risk of endocrinopathies is greater at the start of treatment, justifying closer monitoring every visit over the first 6 months, followed by regular monitoring every second visit over the next 6 months and less frequently thereafter.

# Adrenal

## ADRENAL CASE REPORTS

### *Non-Fasting Hypoglycemia Secondary to Opioid Induced Adrenal Insufficiency: A Case Report*

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**Background:** A patient on chronic methadone therapy presented following a suicide attempt, was noted to have recurrent episodes of non-fasting symptomatic hypoglycemia and was diagnosed with opioid induced adrenal insufficiency (OIAI). Opioid induced endocrinopathies are underappreciated, particularly in the midst of a growing opioid epidemic in the United States. We believe this is the first reported clinical case of OIAI associated with non-fasting hypoglycemia. **Clinical Case:** A 33-year-old female with history of depression and heroine abuse on methadone