

A case of challenging post-operative management in adrenal Cushing's syndrome

N Vanderpant, A Sharma, V Bravis

Department of Diabetes and Endocrinology, St Marys Hospital, Imperial College Healthcare NHS Trust, London
Division of Diabetes, Endocrinology and Metabolism, Imperial College London

Introduction

20% of cases of Cushing's syndrome are caused by a cortisol producing tumour of the adrenal glands.

Adrenalectomy is standard treatment followed by a finite period of glucocorticoid replacement until the hypothalamic-pituitary-adrenal (HPA) axis recovers. In many cases this recovery occurs by 1-2 years at which point hydrocortisone replacement can be stopped [1].

We present a case of treated adrenal Cushing's syndrome where the post-operative course presented several challenges in management.

Case Report

- A 38 year old female was referred with dyslipidaemia, hypertension and weight gain. She also reported symptoms of depression. On examination she had signs of Cushing's syndrome.
- An overnight dexamethasone suppression test showed a cortisol of 429nmol/L and an ACTH of <5ng/L. CT imaging confirmed a 3cm left adrenal tumour. A diagnosis of adrenal Cushing's syndrome was made.
- An uncomplicated laparoscopic left adrenalectomy was performed and 20/10/10mg daily hydrocortisone replacement was commenced and advised to taper. Histopathology confirmed an adrenal cortical adenoma.
- 3 months post-operatively the patient developed severe myalgia of her limbs worsening on attempts to wean the hydrocortisone dose. She remained on 10/10/10mg hydrocortisone. A Hydrocortisone day curve demonstrated adequate glucocorticoid replacement. (Table 1)
- 7 months post-operatively she had ongoing myalgia. In addition she developed symptoms consistent with an anxiety disorder and was referred to a clinical psychologist. A short synacthen test confirmed no recovery of the HPA axis. (Table 2)
- 12 months post-operatively the hydrocortisone was weaned to 10/5/5mg though with some ongoing intermittent myalgia.
- 13 months post-operatively hydrocortisone could not be weaned further due to ongoing myalgia. A short synacthen test confirmed the HPA axis showed no evidence of recovery. (Table 2) The patient remains on 10/5/5mg daily.

References

[1] Guido Di Dalmazi, et al Adrenal Function After Adrenalectomy for Subclinical Hypercortisolism and Cushing's Syndrome: A Systematic Review of the Literature, *The Journal of Clinical Endocrinology & Metabolism*, Volume 99, Issue 8, 1 August 2014, Pages 2637–2645

[2] Christina M. Berr, et al Time to Recovery of Adrenal Function After Curative Surgery for Cushing's Syndrome Depends on Etiology, *The Journal of Clinical Endocrinology & Metabolism*, Volume 100, Issue 4, 1 April 2015

[3] Hurtado MD et al. Extensive clinical experience: Hypothalamic-pituitary-adrenal axis recovery after adrenalectomy for corticotropin-independent cortisol excess. *Clin Endocrinol (Oxf)* 2018 Jul 3. doi: 10.1111/cen.13803.

[4] Pivonello R, Simeoli C, De Martino MC, et al. Neuropsychiatric disorders in Cushing's syndrome. *Front Neurosci*. 2015;9:129. Published 2015 Apr 20. doi:10.3389/fnins.2015.00129

[5] Lorah D. Dorn et al; The Longitudinal Course of Psychopathology in Cushing's Syndrome after Correction of Hypercortisolism, *The Journal of Clinical Endocrinology & Metabolism*, Volume 82, Issue 3, 1 March 1997, Pages 912–919

Investigations

Table 1 Hydrocortisone day curves

Time post-operatively (months)	Hydrocortisone dose (mg)	Cortisol nmol/L (0 mins)	Cortisol nmol/L (120 mins)	Cortisol nmol/L (240 mins)	Cortisol nmol/L (360 mins)
3	10/10/10	<20	319	263	299
13	10/5/5	26	281	151	164

Table 2 Short Synacthen Tests

Time post-operatively (months)	Hydrocortisone dose (mg)	Cortisol nmol/L (0 mins)	Cortisol nmol/L (30mins mins)	Cortisol nmol/L (60 mins)
7	10/10/10	<20	65	63
13	10/5/5	27	65	60

Discussion

This case may demonstrate myalgia and anxiety post-adrenalectomy during the period of normalisation of cortisol secretion. This resulted in delayed weaning of hydrocortisone and possible delayed recovery of the HPA axis.

Suppression of the HPA axis by glucocorticoid secreting adrenal adenomas is well recognised. However the time to recovery of the axis post-adrenalectomy is less well described. A review by Di Dalmazi et al found the mean time to recovery was 11months in patients with overt Cushing's syndrome [1]. Other studies have reported this recovery time as much more variable [2]. One study indicated that HPA axis recovery time was longest for those with a higher hypercortisolaemic state at the time of diagnosis [3].

Cushing's syndrome is known to be associated with psychiatric disorders. Several studies report that psychiatric alterations may be delayed even after resolution of hypercortisolism [4]. Some studies have shown that psychiatric symptoms may even worsen with cortisol decrease [Dorn et al 1997].

Further studies to characterise the clinical course of patients during the post-operative period in Adrenal Cushing's disease would be beneficial. For now it is important that clinicians remain aware of the variation in symptoms and time to HPA axis recovery even after the resolution of hypercortisolism.

