

# Multi-modal treatment strategies for recurrent Cushing's disease in context of a pituitary macroadenoma

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## Background

A 55-year-old gentleman presented to the GP with weight gain, proximal muscle weakness and facial swelling on a background of hypertension. Following his own independent research online, the patient suspected a diagnosis of Cushing's syndrome.

On examination, there was also evidence of bruising. BMI was 42. Investigations were performed to confirm elevated cortisol and to determine the aetiology. Results are shown on the right.

## Investigations and Results

- 24-hour urinary free cortisol 1890nmol/24hr (0-165)
- Plasma ACTH 178ng/L (9-90)
- No suppression on low dose dexamethasone suppression test: T0hrs Cortisol 1592nmol/L, T48hrs Cortisol 1189nmol/L
- CT chest, abdomen, pelvis: Normal
- MRI pituitary: Pituitary macroadenoma (26 x 26 x 19mm) with extension into the suprasellar space and cavernous sinus (Figure1).

## What is Cushing's syndrome?

Cushing's syndrome is a rare condition caused by excess levels of cortisol which is most commonly due to a pituitary adenoma (when it is referred to as 'Cushing's disease').

In this case, a pituitary tumour causes an overproduction of ACTH which stimulates the adrenal glands to produce cortisol in excess (Figure 2). The persistently raised cortisol levels affects the patient both physically and psychologically. People with Cushing's syndrome are also at higher cardiovascular risk.

Treatments for Cushing's disease includes surgery to remove the tumour (first line), radiotherapy and medical management. The 'block-and-replace' strategy aims to suppress cortisol production with high dose Metyrapone and prevent hypoadrenalism with Hydrocortisone. This is usually reserved for severe cases.

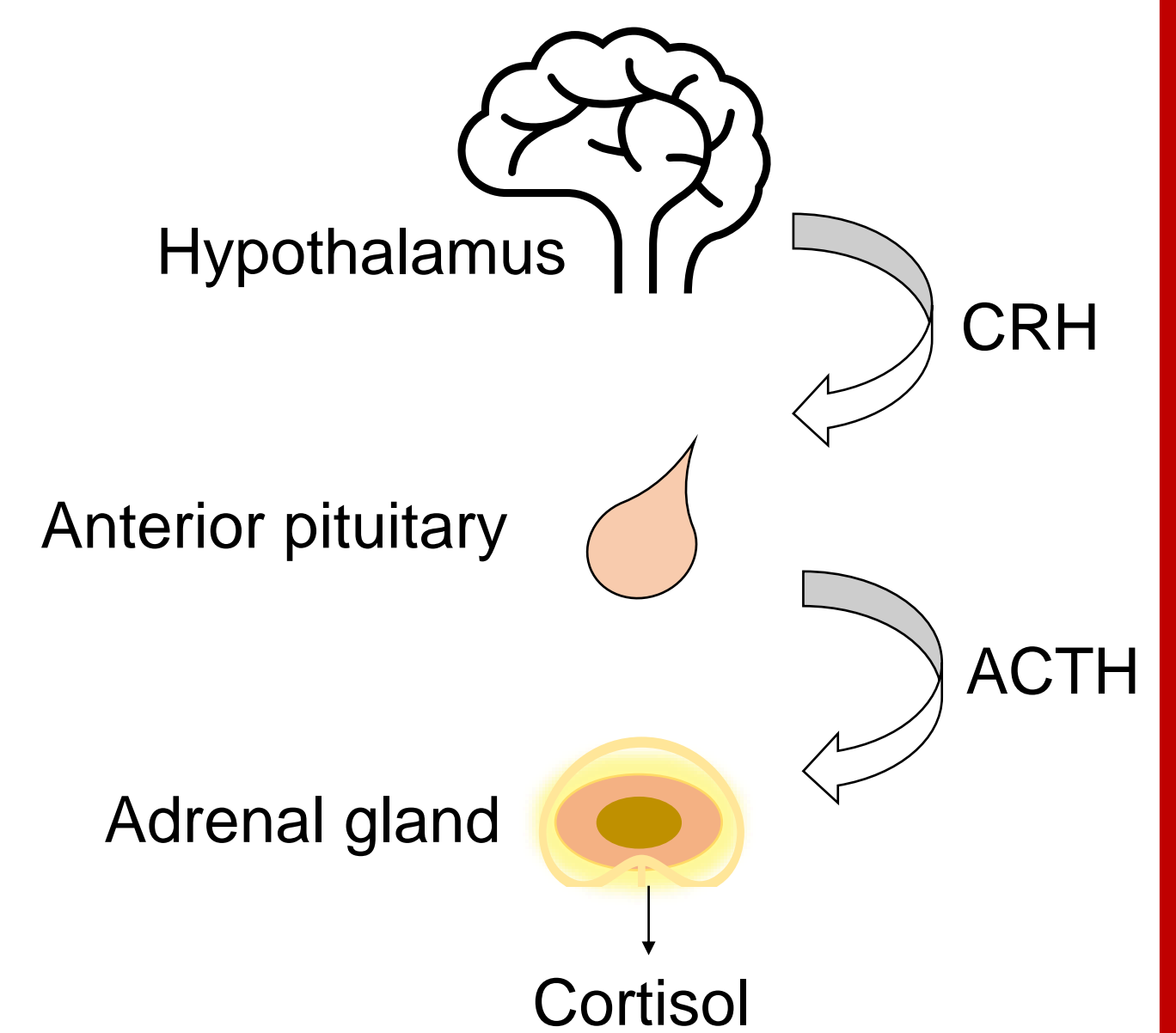
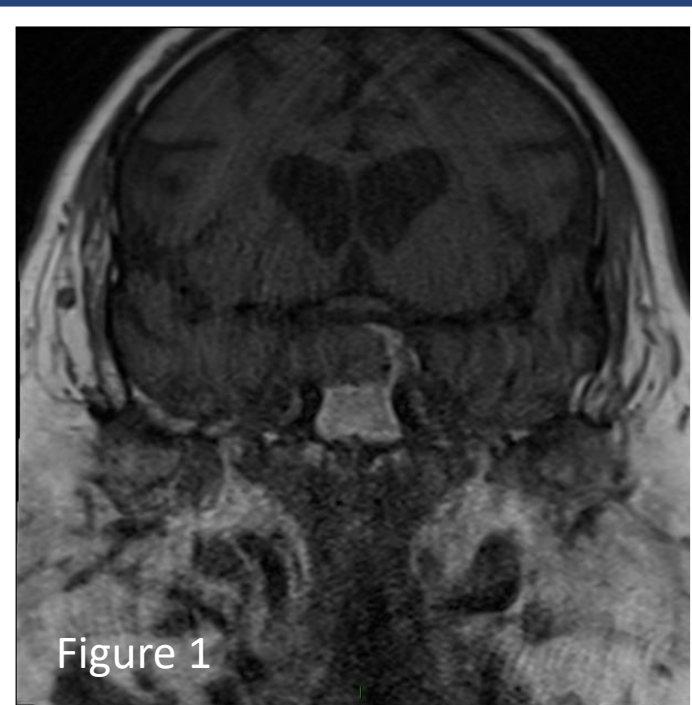


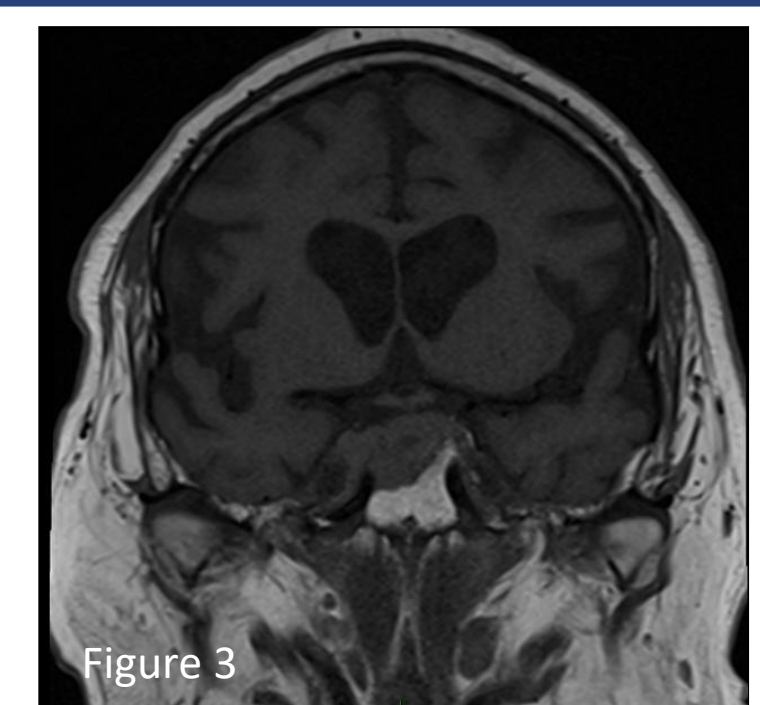
Figure 2: Hypothalamic-pituitary-adrenal axis

## Timeline



Several acute admissions with fluid retention secondary to extreme hypercortisolism. 'Block-and-replace' treatment started.

Rising urinary free cortisol 867nmol/24hr (0-165). Metyrapone and Hydrocortisone restarted. MRI showed residual tumour (inoperable).



3-4 months

6 months

8 months

14 months

18 months

Diagnosis: MRI Pituitary showing macroadenoma (Figure 1).

Transsphenoidal debulking surgery. 3 weeks post-op patient lost 6kg, proximal muscle weakness improved.

Patient underwent volumetric modulated arc radiotherapy.

MRI post-radiotherapy (Figure 3). Urinary-free cortisol normalised. Metyrapone weaning.

## Conclusions

This case emphasises the importance of recognising the symptoms and signs associated with Cushing's syndrome and considering secondary causes of hypertension.

The 'block-and-replace' strategy requires close monitoring of the patient's clinical response and measuring urinary-free cortisol levels.

Continual communication with different specialist teams was necessary to coordinate these complex treatments and deliver care tailored to the individual.