



Cushing's Syndrome in a Young Woman: A Rare Presentation of Adrenocortical Carcinoma

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Abstract

Cushing's Syndrome is rarely caused by a malignant adrenal tumor. We report the case of a 24-year-old female patient with Cushing's syndrome caused by a functioning adrenocortical carcinoma and recovered after adrenalectomy.

Key words

Adrenocortical carcinoma, Cushing's Syndrome

Introduction

Adrenocortical carcinoma (ACC) is a rare and highly malignant tumor with an estimated incidence of 0.5-2 new cases per million per year (1). Approximately 50% of ACCs are hormonally functioning (2). Surgery represents the treatment of choice for ACC and for its local and distant recurrences. We present the case of a young woman who had clinical features of Cushing's syndrome, which on investigations was found to be caused by a hormone producing ACC. The clinical, laboratory and radiological findings are discussed and the relevant literature has been reviewed.

Case Report

A twenty four-year-old unmarried female presented with a seven-month history of puffiness of the face that progressed to generalized swelling of the body. She had noticed striae over the lower limbs, abdomen and lower back at the same time. Besides, she had complaints of amenorrhoea, progressively increasing weakness of the proximal muscles, frontal headaches, polyuria and poor performance in school over the past six months. On examination, the patient had moon facies, truncal obesity, puffiness of the face and eyes, purple striae over breasts, abdomen and thighs, and non-pitting pedal edema. Her blood pressure was 160/100 mmHg. Abdominal examination revealed a lump in the right upper abdomen extending to the right flank of size 10 x 8 cms. An ultrasound of the abdomen showed a large heterogenous mass 13 x 12 x 7.6 cms anterolateral to the upper pole of right kidney, abutting the right lobe of liver and compressing the inferior vena cava. A contrast enhanced

computed tomography (CECT) scan of the abdomen revealed a 20cm x 18 cm sized soft tissue mass with mixed densities in the right suprarenal region. This mass was displacing the right lobe of liver superiorly and the right kidney inferiorly. Areas of necrosis and calcification were seen in the mass.(Fig. 1) The findings were suggestive of a right adrenal gland malignancy. Urine free cortisol concentrations measured as cortisol/creatinine ratios on two successive 24-hour urine collections were raised at 80 and 169 nmol/mmol respectively (reference range 5-55). High dose dexamethasone suppression test was done (dexamethasone 2 mg orally every six hours for 48 hours). Basal serum cortisol was 530 nmol/l and failed to suppress after 48 hours, remaining raised at 525 nmol/l. This was suggestive of primary adrenal disease as cortisol levels normally suppress to less than 50% of basal levels in pituitary driven Cushing's disease. Serum testosterone and urinary catecholamine levels were normal. Cushing's syndrome due to an adrenal malignancy was suspected. Exploratory laparotomy was done which disclosed a large adrenal tumor of size 20 x 15 cms. It was adherant to the inferior surface of the right lobe of liver and the right kidney was pushed down. Anteriorly it was lifting the second part of duodenum and the hepatic flexure of colon. There was a large adrenal vein and an accessory vein from the tumor draining into the IVC. The tumor was excised completely with no spillage of contents.(Fig. 2) The cut section of the tumor showed areas of necrosis with yellowish to

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gray solid lobulated areas. Histopathological examination revealed an adrenocortical carcinoma. The patient recovered completely and is doing well after three years of follow up with no evidence of recurrence or metastasis.

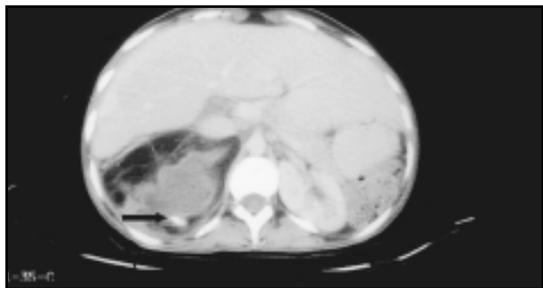


Fig. 1: CECT of the abdomen showing a right adrenal mass with areas of calcification arrow.

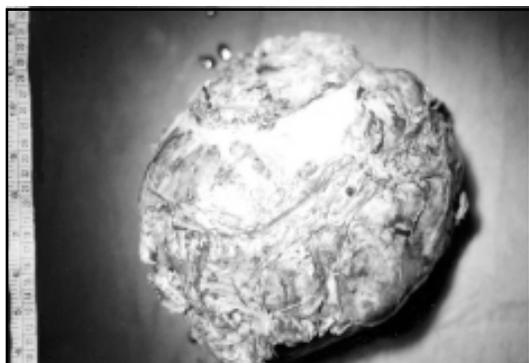


Fig. 2: The completely excised right adrenal mass.

Discussion

Primary diseases of the adrenal gland are responsible for up to 20% of cases of Cushing's syndrome. Cortical adrenal adenomas are the most common, and account for 15% of cases. These benign tumors are usually unilateral, smaller than 4 cm, and secrete cortisol (3). ACCs may also be responsible for adrenocorticotropic hormone (ACTH)-independent Cushing's syndrome (3). They are also usually unilateral, are usually larger than 6 cm, and may hypersecrete more than one hormone (3). Approximately 50% are hormonally functioning (2). Functioning ACC may secrete excess cortisol (30%), androgens (20%), estrogens (10%), aldosterone (10%), or a combination after (35%) (4). ACC is associated with a dismal prognosis. Fortunately, it is rare, accounting for only up to 0.2% of all cancers (1). It has a bimodal incidence, with the first peak before the age of 5 years and the second in the fourth and fifth decades of life (1). Both CT and MRI are useful in the evaluation, of the primary tumor and for detecting regional disease,

vascular and lymph node involvement, and liver and lung metastases. ACCs are usually larger than 6 cm, are heterogenous, have irregular margins, are locally invasive, and are associated with nodal or liver metastases (5). Ultrasound or CT-guided FNAC is advocated by some experts to distinguish malignant from benign adrenal tumors (6). Disadvantages of this procedure are a high false-negative rate and the potential for complications, including seeding of the needle tract, hemorrhage, or fatal hemodynamic instability if the tumor is a pheochromocytoma (3). Furthermore, the FNA result rarely alters clinical decision-making regarding the need for adrenalectomy. Complete surgical resection is the only potentially curative treatment. ACCs are rapidly progressive and have usually metastasized to the lungs and liver at diagnosis. Local disease at diagnosis and complete tumor resection are the two most important prognostic factors (3). Five-year actuarial survival for patients with ACCs ranges from 16% to 60% (7). Recurrent and metastatic disease is common even in patients who undergo complete resection. Approximately two thirds of patients develop recurrence within 2 years and approximately 85% eventually develop local recurrence or distant metastases (7). Mitotane, an isomer of the insecticide DDT, has been used as adjunctive therapy to treat metastatic disease (8).

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