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RESEARCH ARTICLE

CUSHING'S SYNDROME WITH BILATERAL ADRENAL MASSES: WHAT MANAGEMENT?

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Abstract

ACTH independent Cushing's syndrome (CS) with bilateral adrenal masses is an extremely rare entity. Its management constitutes a challenge to clinicians due to difficulty of exact location of the functional lesions. We herein report a case of a 42-year-old patient with a heavy smoking history who presented a CS for 2 years. Serial examinations revealed ACTH independent CS and bilateral adrenal masses on adrenal computed tomography; the largest was on the left measuring 30 x 27 mm. Then the patient underwent a laparoscopic adrenalectomy for left adrenal tumor which diagnosed as an adrenal cortical adenoma with a Weiss Score <2 by the pathological reports. The immediate post-operative course was marked by a corticotroph deficiency that was substituted. The removal of the largest adrenal lesion could represent a therapeutic alternative in the management of bilateral adrenal masses when functional and / or invasive exploration isn't available.

Introduction:-

Cushing's syndrome (CS) is a condition characterised by an excessive and sustained cortisol secretion and is known to have an increased morbidity and mortality. ACTH-independent CS is responsible for 15-20% of cases and is usually a result of unilateral [1,2], rarely bilateral, adrenal masses.

Identifying the nature and the function of bilateral adrenal masses was always a challenge for the clinicians [3, 4]. For this purpose, adrenal vein catheterization is frequently used and 131I-6 β-iodomethyl-19 norcholesterol (131I-NP-59) scintigraphy is becoming less common [2]. However, in absence of these, the management would be more challenging.

Here, we report a case of a patient diagnosed with an independent ACTH SC on a left cortisolic adenoma associated to a contralateral nonfunctional adrenal mass with no recourse to functional and/or invasive exploratory procedures.

Case presentation:

A 42-year-old patient, with a history of a road accident affecting the cranium, and chronic smoking (15 packs/year), was admitted to our institution to explore and manage a cushing's syndrome progressing for 2 years -amidst asthenia and preserved general well-being- without pituitary tumor syndrome.

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On admission, the clinical examination revealed a patient in a fairly good general state, a grade II arterial hypertension with no signs of visceral distress, a grade I obesity with a facio-truncular distribution (BMI= 30.7kg/m2), an elevated waist circumference of 115cm, a capillary blood glucose level in the preprandial lunch period of 0.84g/l, a clinical cushing syndrome (buffalo hump, facial erythrosis with large, vertical, purple stretch marks over 1cm on the abdomen) and a positive Tabouret maneuver on neurological examination. The remaining somatic examination was unremarkable.

Serum blood tests (Table 1) supported an ACTH-independent cushing's syndrome; the nycthemeral cycle was disrupted with a 00h cortisol at 17. 8ug/dl, a urinary free cortisol on 2 occasions elevated (1084.50 and 645 ug/24h), an 8h cortisol after minute dexamethasone suppression returning to 21.2ug/dl (>1.8 ug/dl) and a low ACTH level (1.1 ng/L (7.2-63.3))

Abdominal CT scan focused on the adrenals showed a left adrenal tissue mass measuring 30 x 27 mm in diameter, of homogeneous density (28H.U in C-) with an absolute washout of 11%, and a right adrenal tissue mass measuring 15 x 13 mm in diameter, of spontaneous density (32H.U in C-) with an absolute washout of 32% (Figure1).

Table 1:- The main results of the biological tests.

Tests	**Results**	
Non specific Blood tests	-CBC: Hb: 13.4/dl; WBC: 8500elts/mm3; platelets: 253000e/mm3. -GLycemia in fasting: 0.84g/l - TC: 1.79g/l TG: 0.82g/l LDL-c: 1.19g/l HDL-c: 0.44g/l -PT: 96%.	
Specific blood test	Confirmation	-Cortisol of 8H: 13.4ug/dl -Cortisol of 16H :15.6 ug/dl -Cortisol of 20H: 18.1ug/dl -Cortisol of 00h:17.8ug/dl
		-1st urinary free Cortisol: 645 ug/24h (4.3-176) that is 3.6*N Creatinuria of 24 h: 2091 mg/24h -2nd urinary free cortisol: 1084.50 ug/24h (4.30 -176.00) that is 6.16*N -Creatinuria of 24 h: 2430mg/24h
		-8h Cortisol after suppression test: 21.2ug/dl
	Orientation	-ACTH : 1.1 ng/L (7.2-63.3)
Assessment of the impact	Metabolic	-OGTT with 75g of glucose : normal -TC : 1.79g/l TG : 0.82g/l LDL-c : 1.19g/l HDL-c : 0.44g/l -Uric acid: 67mg/l (35-72) - GOT/GPT: 25/32UI/l - Urea: 0.25 g/l min creatinine: 6 mg/l CC: 157 ml/min (according to MDRD formula))
	Cardiovascular	-TTE: LVH with a 4 mm pericardial detachment posterior to the LV, 72% EF Follow-up TTE: 2 mm vs 4 mm pericardial detachment cardiac recommendation: to be respected
	Osseous	-Blood calcium: 85g/L albumin: 34g/L -Corrected blood calcium: 89.8 g/l -Vitamin D: 15 ng/ml deficiency (

		substitution)

CBC: complete blood count, Hb: Hemoglobin, WBC: White blood cell count, PT: prothrombin time, OGTT: oral glucose tolerance test, TTE: transthoracic echocardiogram, LVH: Left Ventricular Hypertrophy, LV: Left Ventricular, EF: Ejection Fraction

Due to the unavailability of 131I-6î-iodomethyl-19-norcholesterolethral scintigraphy and adrenal vein catheterization, and in order to identify the adrenal gland responsible for the autonomous cortisol secretion, we have decided to remove the mass of the largest diameter, which is the left mass measuring 30 x 27 mm with a tumor size difference of more than 1 cm.

The surgical procedure and the short and long term repercussions were explained to the patient. After his consent, a laparoscopic monobloc resection of the left adrenal gland was performed and carried out without any incident. The pathological results confirmed the diagnosis; it was an adrenal cortical adenoma with a Weiss Score <2.

The immediate postoperative course was characterized by the normalization of blood pressure and the onset of adrenal insufficiency substituted by a 20mg/d dose of oral hydrocortisone, distributed in 2 doses per day, as well as an adrenal insufficiency card.

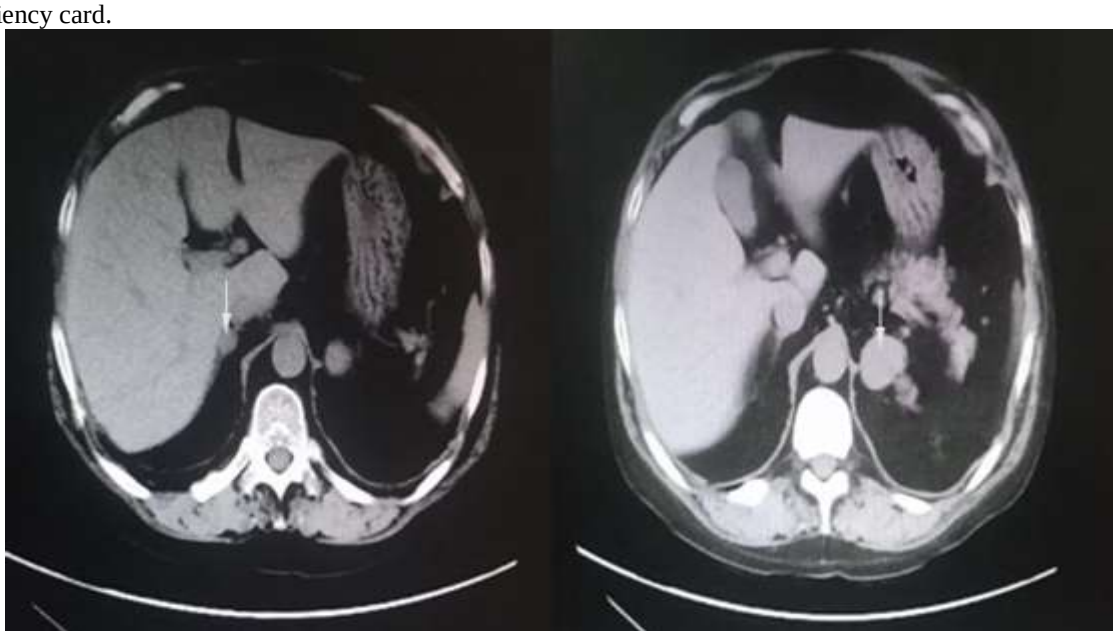

Figure 1:- C- axial CT sections showing two adrenal masses, left 30 x 27 mm and right 15 x 13 mm.

Discussion:-

Most of patients with endogenous CS have ACTH-dependent CS [1,5], whereas the majority of patients with ACTH-independent CS are encountered with a unilateral cortisolic adenoma or carcinoma that is easily identified on imaging and would be straightforward to manage therapeutically later [6].

Independent ACTH CS is occasionally secondary to bilateral adrenocortical lesions, including unilateral functional adenoma with a contralateral nonfunctional mass, bilateral macronodular adrenal hyperplasia, pigmented micronodular adrenal dysplasia and an extremely rare entity: the bilateral adrenocortical tumors [6].

In a patient with bilateral adrenal masses, it is important to determine whether one or both masses are secretive. In such a patient, there may be a bilateral or unilateral cortisol adenoma with a contralateral non-functioning adrenal adenoma or with Conn's adenoma, or bilateral macronodular adrenal hyperplasia [2,7].

CT and MRI cannot ascertain the functional or non-functional nature of the adrenal lesion [1,8], hence, adrenal vein catheterization would be beneficial to determine the uni or bilateral secretory nature in the evaluation of bilateral adrenal adenomas with cushing's syndrome[2,9].

In a study led by Zhenhua Li et al. 3 patients with bilateral adrenal adenomas with a tumor size difference of more than 1 cm underwent unilateral partial adrenalectomy, including the largest adenoma. Postoperatively, only one patient had a persistent hypercorticism, leading to a contralateral partial adrenalectomy followed by a clinical remission of the cushingoid syndrome. For the other 2 cases who underwent partial unilateral adrenalectomy, the postoperative biological evaluation showed a cortisol level of 3.6ug/dl, suggesting that the contralateral adrenal adenoma was non-functional [10].

In another study conducted by Young et al. 10 patients with bilateral masses having an independent ACTH Cushing's syndrome were included in the study, among these ten patients, five had unilateral cortisol hypersecretion on the side of the larger mass on functional testing with a 1 cm difference in tumor size in 4 patients, while only one patient had the same size of bilateral adrenal masses.

Conclusion:-

In case of bilateral adrenal masses and in the lack of a functional and/or an invasive evaluation, the larger adrenal mass may be excised to avoid the complications that are related to the bilateral adrenalectomy. Moreover, a further management should be considered according to the postoperative biological evaluation.

Conflicts of interest

The authors declare no conflicts of interest

Patient consent

Written informed consent was obtained from the patient for publication of the submitted article and the accompanying images.

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