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Case Report

Effect of Laparoscopic Adrenalectomy in Patient with Long-Term Resistant Hypertension Secondary to Primary Aldosteronism: Report of a Curative Treatment

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Abstract

Primary aldosteronism is a disorder in which aldosterone production is inappropriately high for sodium status and no suppressible by sodium loading. Such inappropriate production of aldosterone causes hypertension, cardiovascular damage, sodium retention, suppression of plasma renin, and increased potassium excretion that, if prolonged and severe, may lead to hypokalemia. Primary aldosteronism is commonly caused by an adrenal adenoma, unilateral or bilateral adrenal hyperplasia or, in rare cases, adrenal carcinoma or inherited conditions of familial aldosteronism. The prevalence of primary aldosteronism among hypertensive patients range from 5 to 10%, achieving almost 25% among those with hypertension stage 3 and/or resistant hypertension. Cure of hypertension (defined as blood pressure < 140/90 mmHg with no antihypertensive drugs) occur in about 50% of patients with primary aldosteronism after unilateral adrenalectomy. We report a case of 36-year-old female presented to the hospital with long-term resistant hypertension, cured after adrenalectomy. With this case report, we highlight the importance of clinical suspicion of secondary causes of hypertension, especially primary aldosteronism, the most common of endocrine origin, and its proper treatment on patient prognosis.

Keywords: *Resistant Hypertension; Primary Aldosteronism; Laparoscopic Adrenalectomy; Curative Treatment*

Abbreviations

PA: Primary Aldosteronism; BP: Blood Pressure; ARR: Aldosterone-to-*Renin Ratio*

Introduction

Primary aldosteronism (PA) is also known as Conn's syndrome, in recognition of the researcher who initially described the disorder, its prevalence, and its treatment, in 1955 [1]. It is characterized by excess production of the hormone aldosterone by the adrenal glands, resulting in low levels of renin. The most common causes are adrenal adenoma and adrenal hyperplasia, but it can also occur in rare cases of adrenal carcinoma or at inherited conditions known as familial hyperaldosteronism. Its prevalence is estimated in 5 to 12% around the world [2]. PA is an important cause of secondary hypertension and should always be remembered in patients with resistant hypertension. Although it occurs in less than half of the patients with PA, hypokalemia raises the suspicion of this disease [3]. This condition is important not only because of its elevated prevalence but also because patients with PA have higher cardiovascular morbidity and mortality than age. PA patients are particularly at risk of cardiovascular and renal complications, including arrhythmias, myocardial infarction, stroke,

chronic kidney disease, and death, compared with age-, sex-, and BP-matched essential hypertensives [4]. We describe a case of resistant hypertension, cured after adrenalectomy, a situation that occurs in about 50% of similar cases [3].

Case Report

A 36-year-old female patient was referred with severe hypertension since 14 years old. At the first evaluation, the blood pressure was 170/116 mmHg and heart rate 60 bpm, with no edema, pulmonary auscultation and cardiovascular system with no pathological sounds. A progressive increase in the number of antihypertensives was necessary after four classes at maximum doses tolerated. During the treatment, even with those high doses, the patient maintained systolic blood pressure at 180 mmHg and, persistent hypokalemia (K: 2.4 mg/dL), requiring oral replacement of potassium chloride (900 mg/day). With high aldosterone (52.8 ng/dL) and reduced renin activity (< 0.5 ng/mL/h), the aldosterone-to-*renin ratio* (ARR) was greater than 100, which made it unnecessary to perform aldosterone suppression test or renin stimulation test. In addition, a Doppler ultrasonography of renal arteries was performed, which ruled out the possibility of renovascular disease. Adrenal tomography showed a nodule (2.2 cm) on the lateral wing and right adrenal gland body, less than 10 U on the Hounsfield scale, compatible with adenoma. Faced with this clinical presentation she underwent laparoscopic adrenalectomy in January/2019, without intercurrences. Outpatient consultation 3 months after the surgery showed a significant improvement in serum potassium (5.6 mg/dL), with progressive improvement in blood pressure control and reduction in the number of antihypertensive drugs. At the last outpatient evaluation (April/2019), she presented BP: 110/60 mmHg HR: 70 bpm, normal cardiovascular system, and pulmonary auscultation, with no use of antihypertensive drugs. She remains asymptomatic in outpatient follow-up.

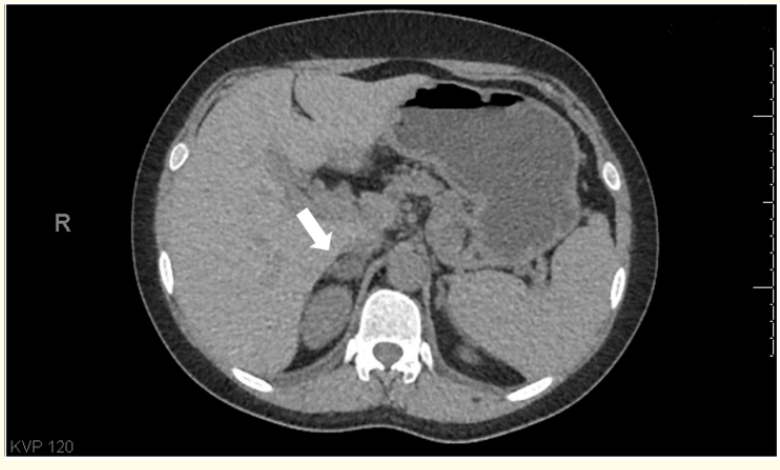

Figure 1: *Computed tomography showing nodule (2,2 cm) on the right adrenal gland body and lateral wing (white arrow).*

Discussion

Patients with primary hyperaldosteronism usually present an unspecific clinical feature and physical examination and may remain asymptomatic. Symptoms related to hypokalemia may be present. Regarding the behavior of BP, it may remain normal, however, 10 - 23% present moderate to severe hypertension and difficult to control. For presenting nonspecific symptoms, the diagnosis is not always made early. In patients with resistant hypertension, it is important to consider this possibility. The suggestive laboratory findings, although not mandatory for diagnosis, are spontaneous or diuretic-induced hypokalemia, inappropriate kaliuresis during hypokalemia (urinary K +> 30 mEq/24 h) and metabolic alkalosis. It is important to note that some patients may maintain normal levels of serum potassium. An ARR > 25 suggests the diagnosis of PA but requires subsequent confirmatory tests [5,6]. In typical cases with hypokalemia, inadequately elevated kaliuresis, elevated serum aldosterone and ARR > 40, the diagnosis is established without further testing. In this clinical scenario, adrenal computed tomography is the first-choice imaging method in the evaluation of patients with PA, with a sensitivity of 70 - 90% [7] in

the detection of adenomas. The finding of a unilateral adrenal nodule or bilateral nodules does not guarantee the diagnosis of aldosterone-producing adenoma since often non-functioning adrenal nodules are incidentally discovered (incidentalomas). Patients with aldosterone-producing adenoma usually present the most severe forms of aldosteronism, with hypokalemia and hypertension more pronounced [6]. The patient remained asymptomatic, but with low serum potassium levels. Moreover, she had severe BP. These two factors led to the hypothesis of PA. The initial investigation demonstrated high Aldo/RPA, then computed tomography showed a nodule in the right adrenal gland, compatible with adenoma [8]. Adrenalectomy is the treatment of choice for patients with unilateral disease, mainly in cases of adenoma. In the postoperative period, patients usually present with a resolution of hypokalemia, reduction of aldosterone secretion, and improve hypertension, defined as BP < 140/90 mmHg without antihypertensive drugs, observed in 17 - 62% of cases [9]. We performed adrenalectomy that was a curative treatment. The patient does not currently need drugs for the treatment of hypertension.

Conclusion

Primary hyperaldosteronism is an important cause of hypertension in patients with resistant hypertension. Laparoscopic adrenalectomy may be a curative treatment even in patients with severe long-term hypertension.

Conflict of Interest

There is no conflict of interest.

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