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IMAGES IN HYPERTENSION

Primary Aldosteronism

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ABSTRACT

Primary aldosteronism (PA) is an important secondary cause of hypertension. Although rare, PA should be suspected in patients with resistant hypertension who demonstrate unexplained hypokalemia. Correct diagnosis of the condition leads to appropriate medical or surgical therapy which can improve and/or cure the condition.

Keywords: Adrenal gland, Chemical-shift, Primary aldosteronism.

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INTRODUCTION

Primary aldosteronism (PA) is caused by inappropriate, spontaneous, and unprovoked production of aldosterone from the adrenal cortex. In the clinical setting, patients who have resistant hypertension should be tested for PA based on subtle but important biochemical abnormalities due to aldosterone excess. Imaging plays a major role in detecting adenoma or bilateral adrenal hyperplasia of the adrenal gland by computed tomography (CT) and/or magnetic resonance (MR) (Fig. 1).

CLINICAL ASPECTS OF PRIMARY ALDOSTERONISM

Primary aldosteronism is an unusual but an important secondary cause of secondary hypertension. Aldosterone excess occurs in PA due to spontaneous overproduction of aldosterone, which in turn leads to severe hypertension accompanied by hypokalemia. Primary aldosteronism should be distinguished from secondary aldosteronism which is due to stimulation of aldosterone for a reason, such as volume depletion, increased renin secretion, or stimulation of sympathetic nervous system.

A typical patient with PA presents with the following constellation of clinical manifestations – hypertension, spontaneous hypokalemia, high normal serum sodium level, and metabolic alkalosis.[2] Usually, patients with PA are asymptomatic but can present with manifestations of hypokalemia, such as muscle cramps, abdominal distress, fatigue, and cardiac arrhythmias. The biochemical confirmatory diagnosis of PA depends on demonstration of a high aldosterone to renin ratio. In other words, low plasma renin activity plus high or high normal aldosterone level.

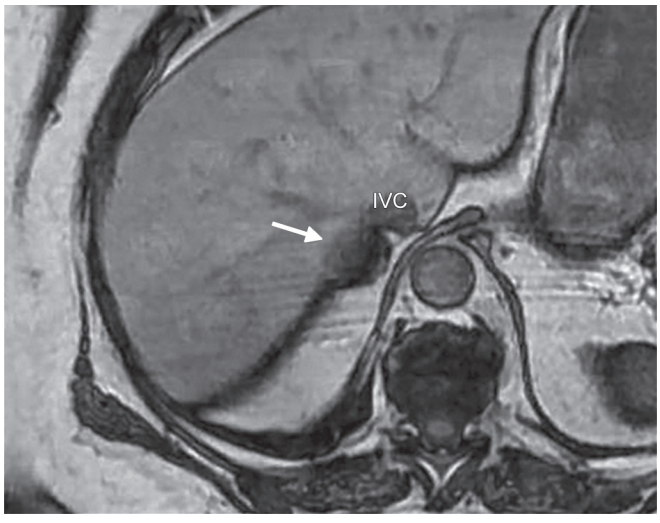

Fig. 1: Magnetic resonance imaging – adenoma of right adrenal gland

RADIOLOGICAL IMAGING

Radiological imaging with magnetic resonance imaging (MRI) or thin slice CT is a critical step in the management of PA. Early experience with MRI in the diagnosis of aldosterone-producing adenoma (APA) has been encouraging. Aldosterone-producing adenomas (APAs) are isointense or hypointense relative to the liver on T1-weighted images; they are slightly hyperintense on T2-weighted images (Fig. 1).

Chemical-shift imaging is a useful method for the characterization of adrenal masses. It is based on the principle that fat protons precess faster than do water protons. Chemical-shift MRI is highly sensitive and specific for the differentiation of benign from malignant adrenal tumors, because benign adrenal tumors contain fat, while malignant adrenal tumors rarely do. With chemical-shift imaging, the signal intensity has been found to decrease on out-of-phase images in 86% of patients with APAs and in 89% of patients with bilateral adrenal hyperplasia.[3-7]

If the patient has unilateral adenoma, the preferred treatment is (laparoscopic) surgical excision of the adrenal

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mass. For patients with bilateral adrenal hyperplasia or bilateral adenomas, the preferred treatment is medical management of hypertension and restoration of potassium balance with supplements and aldosterone antagonists.

REFERENCES

1. Ram CVS. Primary aldosteronism – recognition and management. Rhode Island Med J 1977 June;60(6):301-305.
2. Ram CVS. Primary aldosteronism – its role in hypertension. Consultant 1981;21:2-11.
3. Das CJ, Baruah MP, Baruah UM. Radiological imaging in endocrine hypertension. Indian J Endocrinol Metab 2011 Oct;15(Suppl 4):S383–S388.
4. Sohaib SA, Peppercorn PD, Allan C, Monson JP, Grossman AB, Besser GM, Reznek RH. Primary hyperaldosteronism (Conn syndrome): MR imaging findings. Radiology 2000 Feb;214(2):527-531.
5. Mayo-Smith WW, Boland GW, Noto RB, Lee MJ. State-of-the-art adrenal imaging. Radiographics 2001;21:995-1012.
6. Rossi GP, Chiesura-Corona M, Tregnaghi A, Zanin L, Perale R, Soattin S, Pelizzo MR, Feltrin GP, Pessina AC. Imaging of aldosterone-secreting adenomas: a prospective comparison of computed tomography and magnetic resonance imaging in 27 patients with suspected primary aldosteronism. J Hum Hypertens 1993 Aug;7(4):357-363.
7. Krebs TL, Wagner BJ. MR imaging of the adrenal gland: radiologic-pathologic correlation. Radiographics 1998 Nov-Dec;18(6):1425-1440.