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Sustaining the momentum: Negative cross-sectional imaging for primary hyperaldosteronism should not preclude endocrine surgical referral ☆

To the Editors:

Primary hyperaldosteronism (PA) has been increasingly recognized as a factor in medication-refractory hypertension, believed to be present in approximately 10%–20% of the hypertensive population.[1] With 46% of adults 18 years or older in the United States (equivalent to 103 million individuals) diagnosed with hypertension,[2] it is likely that many patients with a surgically correctable cause for hypertension go untreated and risk ongoing end-organ damage.

In most cases a patient's journey to the surgical consultation office is compulsorily routed through an endocrinologist, cardiologist, primary care physician, or others. Although there has been no study of referring physicians on which to base these assertions, there are likely a handful of reasons that patients with PA may not get referred for surgical evaluation. First, the significant prevalence of PA among hypertensive patients may be unknown because PA was once considered to be a rare cause of hypertension, so the necessary biochemical testing used to secure a diagnosis may not be considered or obtained. Second, once a biochemical diagnosis has been made, patients may not be referred for surgical care if cross-sectional imaging does not produce convincing evidence of unilateral disease. With PA, as with primary hyperparathyroidism, a vague or inconclusive imaging result can often represent the terminal branch of the algorithm tree leading to surgical consultation. Given that patients with bilateral disease in PA are optimally treated with medical therapy, this rationale can make sense on the surface.

However, the paper by Wachtel et al[3] provides further evidence about this second group of patients who are less likely to be referred for surgery. Their question addresses whether patients with a biochemical diagnosis of PA but no evidence of a unilateral adrenal adenoma on computed tomography (CT) benefit from adrenalectomy. This study found that a large subset of patients do not have an identifiable adenoma on cross-sectional imaging but are ultimately found to have unilateral disease with the addition of adrenal vein sampling.

The literature is replete with studies that support the use of adrenal vein sampling (AVS) in all patients with a biochemical diagnosis of PA, resulting in up to 50% of patients having a change in surgical management strategy.[4] In addition, AVS has been recommended for the large majority of patients with PA in guidelines from the Endocrine Society.[5] Thus although an initial CT scan or magnetic resonance imaging may not indicate a visible adenoma, there remains a subset of this population who will prove to have subcentimeter disease that may not be readily identifiable on imaging but underlies the biochemical abnormality. At present the best way to secure this diagnosis and recommend the most appropriate therapy is performance of AVS.

This paper also provides further evidence for the utility of AVS in patients younger than age 40 years. Ongoing controversy has centered on whether this invasive diagnostic technique is necessary in this population, and data from this study continue to indicate that it remains a key diagnostic element. More specifically, the authors found that that although the positive predictive value of CT scanning for localization of an adrenal mass in the context of PA was higher in patients younger than 40 years compared with the study population as a whole (84.4% vs 67.7%), foregoing AVS would have resulted in an unacceptable number of patients being suboptimally treated. Particularly at centers where performance of this technique is reliable, it provides enhanced certainty that a chosen treatment strategy will result in exceptional outcomes for the patient.

The authors of the present study found that patients without a localizing mass on CT required significantly more medications to remain normotensive postoperatively and experienced a partial reversal of short-term improvements. These findings should not be a cause for confusion about which patients should or should not undergo adrenalectomy. Given the retrospective study design, it is difficult to feel confident that the groups being compared are not different in some unmeasured or incorrectly reported variable, such as the duration of time patients have had hypertension before PA diagnosis, which can lead to enhanced peripheral vascular resistance and worsened hypertension.

In addition, the definition of success for adrenalectomy in PA is controversial. Although Wachtel et al[3] used published definitions for clinical success based on blood pressure measurement, they would likely be reporting different results if the Primary Aldosteronism Surgical Outcome criteria[6] were used. Although these criteria provide a standardized framework for reporting of adrenalectomy outcomes in PA, the complete cure rates reported are strikingly low, likely because clinical cure requires the patient to no longer

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need any antihypertensives. This is problematic because it is well documented that hypertension is an almost universally multifactorial phenomenon. Thus we assert that long-term operative success should be defined not by blood pressure measurement or use of antihypertensive medications but by normalization of the hormone levels used for biochemical diagnosis preoperatively, although we recognize that these data have not been readily available in long-term follow-up.

Further study is needed to examine rates of hormone normalization over the long-term postoperative period. Such evaluation would add a higher degree of precision to the discussion about whether unilateral adrenalectomy for PA is worthwhile in the group of patients with unilateral adrenal masses not localized on cross-sectional imaging but identified through adrenal vein sampling.

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References

1. Calhoun DA. Hyperaldosteronism as a common cause of resistant hypertension. *Ann Rev Med*. 2018;64:233–247.
2. Muntner P, Carey RM, Gidding S, Jones DW, Taler SJ, Wright Jr JT, et al. Potential US population impact of the 2017 ACC/AHA high blood pressure guideline. *Circulation*. 2018;137:109.
3. Wachtel et al. TK FROM AU
4. Mathur A, Kemp CD, Dutta U, Baid S, Ayala A, Chang RE, et al. Consequences of adrenal venous sampling in primary hyperaldosteronism and predictors of unilateral adrenal disease. *J Am Coll Surg*. 2010;211:384–390.
5. Funder JW, Carey RM, Mantero F, Murad MH, Reincke M, Shibata H, et al. The management of primary aldosteronism: Case detection, diagnosis, and treatment: An Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab*. 2016;101:1889–1916.
6. Miller BS, Turcu AF, Nanba AT, Hughes DT, Cohen MS, Gauger PG, et al. Refining the definitions of biochemical and clinical cure for primary aldosteronism using the Primary Aldosteronism Surgical Outcome (PASO) Classification System. *World J Surg*. 2018;42:453–463.