UTILITY OF USING ONLY LEFT-SIDED ADRENAL VEIN SAMPLING DATA IN LATERALIZING PRIMARY ALDOSTERONISM

Background:

Primary aldosteronism (PA) is present in up to 10% of patients with hypertension, and those with unilateral PA are surgical candidates. Adrenal vein sampling (AVS) is the gold standard for determining laterality; however, it is technically challenging, with success rates varying widely between institutions. Depending on the experience of the interventional radiologist, AVS may fail to achieve bilateral adrenal vein sampling in 50% or more of patients. Inability to cannulate the right adrenal vein (RAV) is the most common reason for AVS failure. In the absence of RAV data, comparison of aldosterone levels from just the left adrenal vein (LAV) and inferior vena cava (IVC) may correctly predict laterality. A previous publication found that LAV/IVC ratios of >5.5 and <0.5 accurately predicted left- and right-sided disease, respectively. The aim of this study was to evaluate the accuracy of these LAV/IVC criteria in predicting unilateral hyperaldosteronism at our institution.

Methods:

Retrospective review was performed of all patients undergoing AVS at our institution from 2012-2019 (n=67). AVS was performed with ACTH stimulation, adrenal veins were cannulated sequentially and a selectivity index (AV/IVC cortisol level) > 5 defined successful cannulation. Only patients with complete AVS data were included. A lateralization index (high-side aldosterone/cortisol over low-side aldosterone/cortisol) > 4 defined unilateral disease. Results were then analyzed as if the RAV data was unavailable, utilizing only the LAV/IVC "5.5-0.5" criteria to predict laterality.

Results:

AVS was successful on first attempt in 60 patients (89.6%) with 7 patients undergoing successful repeat AVS. Based on assessment of complete AVS data, 48 (71.6%) patients had unilateral and 19 (28.4%) had bilateral disease. If only the LAV/IVC data were utilized (see figure), the upper cutoff (>5.5) was 100% specific (100% PPV) for correctly predicting left lateralization; however, the sensitivity was only 14% (3 of 21 patients met the > 5.5 cutoff). The lower (<0.5) LAV/IVC cutoff was only 90% specific (85% PPV) and would have resulted in 4 out of 19 patients in the bilateral cohort being *incorrectly* identified as lateralizing to the right. Lowering the LAV/IVC cutoff to <0.1 resulted in 100% specificity/PPV for both high and low cutoffs but would have resulted in 33/48 patients with unilateral disease having inconclusive results. This would still allow for ~22% (15/67) of patients to avoid repeat AVS if these guidelines were followed.

Conclusion:

This study found that the previously published LAV/IVC "5.5-0.5" criteria would have correctly predicted laterality in 26/48 (54%) of our patients with unilateral disease but would have incorrectly predicted unilateral disease, leading to unnecessary surgery, in 4/19 (21%) patients with bilateral disease. Adjusting the LAV/IVC criteria to "5.5-0.1" achieved 100% PPV but limited the utility, as only about 20% of AVS patients would

meet the criteria. Thus, the LAV/IVC ratio may be useful in guiding management of PA in *select* patients with unsuccessful AVS; however, the decision of whether to repeat AVS versus proceed to surgery should be based on careful discussion between surgeon and patient.