

## A case of Aldosterone-producing Adenoma Diagnosed by Super-selective Adrenal Vein Sampling

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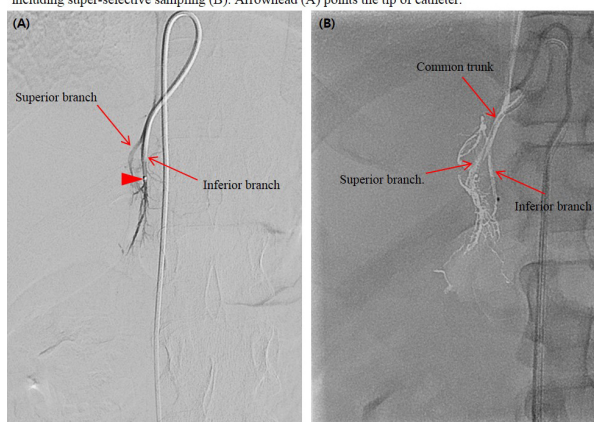
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**Introduction:** Adrenal vein sampling (AVS) is a gold standard test to differentiate between unilateral adrenal adenoma and bilateral adrenal hyperplasia in primary hyperaldosteronism. The cortisol-corrected aldosterone ratio (CCAR) from high-side to low-side (lateralization index) should be at least 4:1 to diagnose unilateral adrenal adenoma. In this case report, we introduce a 38-year-old male patient with lateralization index of 1.41 who were successfully diagnosed as unilateral adrenal adenoma using repeated AVS with super-selective sampling.

**Case:** A 38-year-old man came to our hospital with sudden increase of blood pressure of 200/100mmHg. Initial investigation showed hypokalemia (potassium 3.0mmol/L). Serum aldosterone and renin levels were 64ng/dL and 0.07ng/mL/hour, making the aldosterone/renin ratio as 914. A saline loading test was omitted due to spontaneous hypokalemia, serum aldosterone >30ng/dL, and definitely low level of renin. A CT scan showed an 18\*14mm sized right adrenal adenoma. AVS revealed that the CCAR of the left adrenal vein, and right adrenal vein were 0.27, and 0.38 suggesting bilateral disease. However, CCAR of the IVC (4.35) was unexpectedly higher than that of both adrenal veins. In consideration of accidentally deep sampling in which venous sampling was done from non-adenoma draining tributary vein (Fig. 1A), repeated AVS was performed with super-selective sampling of all accessible tributaries from right adrenal vein (Fig. 1B). The results of CCAR were 62.54, 29.72, and 0.58 in the right common adrenal vein, right superior adrenal vein, and right inferior adrenal vein, respectively (Table 1). Finally, right aldosterone-producing adenoma draining into right superior adrenal vein was confirmed. After right laparoscopic adrenalectomy, blood pressure and serum potassium of the patient remained normal without medications.

**Conclusion:** When encountered AVS in which both adrenal CCARs are lower than IVC CCAR, accidental deep sampling from non-adenoma draining tributary vein should be considered. Super-selective sampling in addition to repeated AVS may be helpful to precisely localize aldosterone hypersecretion.

**Figure 1.** Adrenal venography of initial adrenal vein sampling (A) and repeated adrenal vein sampling including super-selective sampling (B). Arrowhead (A) points the tip of catheter.



**Table 1.** Results of initial and repeated adrenal vein sampling with super-selective sampling.

|  | Aldosterone (ng/dL) | Cortisol (ug/dL) | CCAR  |
|--|---------------------|------------------|-------|
| Initial adrenal vein sampling                                |                     |                  |       |
| Right adrenal vein   | 239                 | 630              | 0.38  |
| Left adrenal vein  | 582                 | 582              | 0.27  |
| IVC  | 100                 | 23               | 4.35  |
| Repeated adrenal vein sampling with super-selective sampling |                     |                  |       |
| Right superior adrenal vein                                  | 24,400              | 821              | 29.72 |
| Right inferior adrenal vein                                  | 576                 | 990              | 0.58  |
| Right common adrenal vein                                    | 35,400              | 566              | 62.54 |
| Left adrenal vein  | 207                 | 849              | 0.24  |
| IVC  | 122                 | 33.6             | 3.63  |