Supplementary Methods

1. Confirmatory Tests

The captopril challenge test was considered positive if aldosterone suppression rate was <30% or aldosterone level ⩾11 ng/dL at 2 hours after oral administration of 50 mg captopril. The saline infusion test was positive if aldosterone level >10 ng/dL after 4-hour intravenous infusion of 2 L 0.9% sodium chloride solution; levels of 5–10 ng/dL were considered borderline positive.

2. Adrenal Venous Sampling (AVS)

The selectivity index (SI) was calculated as the ratio of cortisol concentration in the adrenal vein to that in the inferior vena cava to confirm adequate cannulation, with SI ⩾2:1 (without ACTH stimulation) or ⩾3:1 (with ACTH stimulation) indicating successful sampling. The lateralization index (LI) was calculated as the aldosterone/cortisol ratio (ACR) of the higher side divided by the contralateral ACR. The contralateral suppression index (CI) was calculated as the ACR of the lower side divided by the ACR of the distal inferior vena cava. Unilateral PA was defined as LI ⩾4 post-ACTH stimulation or LI ⩾2 without ACTH stimulation.

3.Echocardiography examination

All subjects underwent transthoracic echocardiography performed by professional sonographers using a GE Vivid E9 ultrasound system (GE Vingmed Ultrasound, Horten, Norway) equipped with a 1.7–3.3 MHz transducer, following American Society of Echocardiography (ASE) guidelines[1]. In the parasternal long-axis view, left ventricular end-diastolic diameter (LVEDD), interventricular septal thickness (IVST), left ventricular posterior wall thickness in diastole (LVPWT), and left atrial diameter (LAD) were measured. Left ventricular ejection fraction (LVEF) was assessed using the biplane Simpson's method. Pulsed-wave Doppler in the apical four-chamber view was used to measure peak early (E) and late (A) transmitral inflow velocities. The E/A ratio was calculated as an index of left ventricular diastolic function; an E/A ratio <1 indicated impaired myocardial relaxation[2]. Mitral annular early diastolic velocity (e' velocity) and the ratio of early transmitral flow velocity to mitral annular velocity (E/e') were also measured. The E/A ratio, e' velocity, and E/e' ratio are known as indices for LV diastolic dysfunction[3].

4. Imaging examination

Abdominal computed tomography (CT) scans were performed on a 64-slice CT scanner using the following parameters: 120 kVp, 0.5-second rotation time, and 1.25 mm slice thickness. Portal venous phase contrast-enhanced abdominal CT images obtained at diagnosis were analyzed by investigators blinded to clinical diagnoses using body composition analysis software (Syngo.via Client 10.6, Siemens, Germany). The software automatically detected the third lumbar vertebra

(L3) and measured skeletal muscle area (SMA), visceral fat area (VFA), subcutaneous fat area (SFA), and intermuscular fat area (IMFA) at the L3 level. Mean CT attenuation values (Hounsfield units, HU) were recorded for each parameter (Figure 2). To compare body composition across groups, SMA, VFA, SFA, and IMFA were normalized to body mass index (BMI, SMA/BMI, VFA/BMI, SFA/BMI, IMFA/BMI)[4–6].

(1) Renal sinus fat (RSF) Measurement

RSF boundaries were defined by visual inspection as the linear trajectory extending from the indentation between two adjacent poles across the renal sinus opening, thereby excluding surrounding abdominal adipose tissue from the measurement (Figure 2). To adjust for kidney size, the ratio of RSF tissue volume to corresponding total kidney volume was calculated using the arithmetic mean for each subject[7,8].

(2) Epicardial Adipose Tissue (EAT) Measurement

Cardiac fat deposition was quantified using TIMESLicepro (https://slice-doc.netlify.app/;TIMESLicepro v5.0.2; China). EAT volume was defined from the level of pulmonary artery bifurcation to pericardial disappearance, with the EAT region identified as fat tissue between the myocardium and pericardium. Adipose tissue was defined by CT attenuation values between -190 and -30 HU[9–12].

(3) Hepatic Steatosis Measurement

Two circular regions of interest (ROI) of 1.5 cm^2 were placed at two different sites in each segment of the right hepatic lobe (segments V, VI, VII, and VIII according to the Couinaud system). Hepatic attenuation (L) was calculated as the mean HU value across all eight ROIs. Spleen attenuation (S) was obtained by averaging HU values from three 1.5 cm^2 circular ROIs placed in the upper, middle, and lower thirds of the spleen. Portal vein (P) and abdominal aorta (A) attenuation were measured by placing three circular ROIs as large as possible in the main portal trunk and aorta at the celiac axis level across three different images, respectively. Hepatic steatosis was calculated using the formulas: $L\text{-}B = [L - 0.3 \times (0.75 \times P + 0.25 \times A)] / 0.7$, L-S, and L/S ratio (Figure 2)[13,14].

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