

BACKGROUND: Cardiac abnormalities are frequent in patients with atherosclerotic renovascular disease (ARVD). The Angioplasty and Stenting for Renal Artery Lesions (ASTRAL) trial studied the effect of percutaneous renal revascularization combined with medical therapy compared with medical therapy alone in 806 patients with ARVD. **METHODS:** This was a pre-specified sub-study of ASTRAL (clinical trials registration, current controlled trials number: ISRCTN59586944), designed to consider the effect of percutaneous renal artery angioplasty and stenting on change in cardiac structure and function, measured using cardiac magnetic resonance (CMR) imaging. Fifty-one patients were recruited from six selected ASTRAL centres. Forty-four completed the study (medical therapy n = 21; revascularization n = 23). Full analysis of CMR was possible in 40 patients (18 medical therapy and 22 revascularization). CMR measurements of left and right ventricular end systolic (LV and RVESV) and diastolic volume (LV and RVEDV), ejection fraction (LVEF) and mass (LVM) were made shortly after recruitment and before revascularization in the interventional group, and again after 12 months. Reporting was performed by CMR analysts blinded to randomization arm. **RESULTS:** Groups were well matched for mean age (70 versus 72 years), blood pressure (148/71 versus 143/74 mmHg), degree of renal artery stenosis (75 versus 75%) and comorbid conditions. In both randomized groups, improvements in cardiac structural parameters were seen at 12 months, but there were no significant differences between treatment groups. Median left ventricular changes between baseline and 12 months (medical versus revascularization) were LVEDV -1.9 versus -5.8 mL, P = 0.4; LVESV -2.1 versus 0.3 mL, P = 0.7; LVM -5.4 versus -6.3 g, P = 0.8; and LVEF -1.5 versus -0.8%, P = 0.7. Multivariate regression also found that randomized treatment assignment was not associated with degree of change in any of the CMR measurements. **CONCLUSIONS:** In this sub-study of the ASTRAL trial, renal revascularization did not offer additional benefit to cardiac structure or function in unselected patients with ARVD.