

Different aortic valve calcium scores by computed tomography scan in patients with severe aortic stenosis and concomitant cardiac amyloidosis

G. Satri, L. Santona, M.S. Sguazzotti, A.G. Caponetti, P. Massa, A. Ponziani, C. Gagliardi, A.G. Giovannetti, L. Lovato, D. Attina, R. Bonfiglioli, F. Saia, N. Galie, E. Biagini, S. Longhi

Azienda Ospedaliero, Universitaria di Bologna, Policlinico S.Orsola-Malpighi, Bologna, Italy

Funding Acknowledgement: Type of funding sources: None.

Background: The coexistence of cardiac amyloidosis (CA) and degenerative aortic stenosis (AS) is increasing but the diagnosis is challenging because these two conditions share a common echocardiographic phenotype (1). Different predictors have been proposed in the last few years, including clinical, ECG-graphic and echocardiographic features (2–3).

Purpose: To identify a new marker of concomitant CA in patients with severe AS analyzing computed tomography scan (CT).

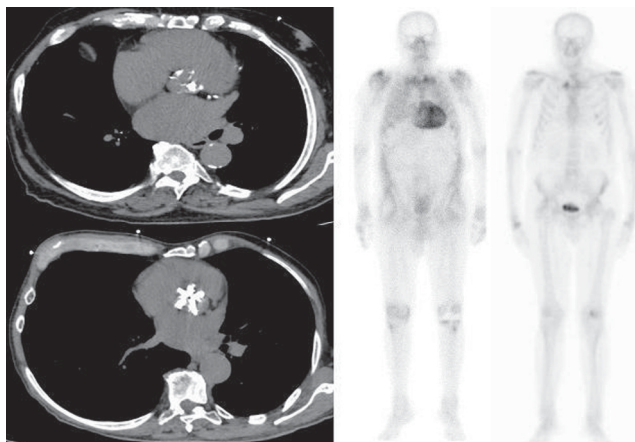
Methods: 55 patients with severe AS and suspicion of concomitant CA were retrospectively enrolled. Patients with a bicuspid aortic valve, previous aortic valve replacement, or an incomplete diagnostic workup for CA were excluded. 33 patients underwent CT-scan and were included in the final analysis.

Results: None of the patients presented laboratory suspicion for AL amyloidosis; 12 patients (AS-CA) had positive 99m Tc-DPD bone scintigraphy (two with visual score 1, eight score 2 and two score 3), 21 patients (AS-alone) had negative bone scintigraphy. AS-CA patients had a median age of 85,5 years (versus 81,5) with only one female patient (versus 8 in the AS-alone group). AVA indexed were comparable between AS-CA and AS-alone groups (0,4 versus 0,3 mm²/m², p: 0.25). Stroke volume evaluated by pulsed Doppler, maximum and mean gradient were significantly lower in AS-CA group (respectively 30 versus 41 ml/m², p: 0.017, 62 versus 74 mmHg, 0.038 and 33 versus 46 mmHg, p:0.022) with a higher percentage

of low flow-low gradient aortic stenosis in AS-CA group (7 patients, 58% vs 3 patients in AS-alone 14%, p: 0.027), in line with the literature. ECG at first presentation in AS-CA group showed atrial fibrillation in 8 patients (67%), versus 2 patients in the AS-alone group (10%), and lower QRS voltages (peripheral QRS score 40 mV vs 51 mV, p-value:0.017; total QRS score 113 mV versus 155 mV, p-value: 0.005). The echocardiogram showed a more thickened IVS and PW in AS-CA patients (17 versus 15 mm, p: 0.05 and 15 versus 14 mm, p: 0.013), an augmented left ventricular mass (441 versus 356 g, p: 0.036) with a decreases longitudinal systolic function (septal S wave at TDI 4.4 versus 5.2 cm/s, p: 0.026, lateral S wave 4.1 versus 5.6 cm/s, p: 0.024) and a reduction in myocardial contraction fraction (12 versus 14%, p: 0.036).

CT- aortic valve calcium was quantified by an experienced operator. A statistically significant difference between AS-CA and AS-alone groups was observed in calcium score (3345 versus 4785 Hounsfield units, p: 0.037) calcium volume (2411 versus 3626 mm², p: 0.03) and calcium mass (687 versus 1147 g, p: 0.023)

Conclusions: This study is the first to our knowledge to use relative aortic valve calcium score evaluation from CT imaging to characterize patients with severe AS with or without concomitant CA in addition to the classical clinical, ECG graphic, echocardiographic parameters. CT-aortic valve calcium burner was significantly lower in patients with concomitant CA.



CT scan and bone scintigraphy