Mitral annular calcification volume predicts one year cardiovascular mortality after transcatheter aortic valve implantation.

Authors:
B Duband¹, B Harbaoui¹, C Becle¹, G Souteyrand², PY Courand¹, H Eltchaninoff³, L Boussel⁴, E Durand³, T Lefèvre⁵, P Motreff⁵, P Lantelme¹, ¹Civils Hospices of Lyon, Cardiology Department, Hôpital Croix-Rousse and Hôpital Lyon Sud - Lyon - France, ²University Hospital Gabriel Montpied, Department of Cardiology - Clermont-Ferrand - France, ³University Hospital of Rouen, Cardiology Service, National Institute of Health and Medical Research U644 - Rouen - France, ⁴Civils Hospices of Lyon, Radiology Department, Hôpital Croix-Rousse - Lyon - France, ⁵Institut Cardiovasculaire Paris Sud, Ramsay–Générale de Santé - Paris - France,

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INTRODUCTION
Mitral annular calcifications (MAC) and aortic stenosis (AS) share some similar pathophysiologic mechanisms. In patients treated with transcatheter aortic valve implantation (TAVI), significant MAC and AS are encountered together in about 20% of cases. Qualitative assessments of MAC that has been mostly considered as a dichotomous or other categorical variable suggest a link with outcomes, however the prognosis impact of a precisely quantified MAC volume has never been tackled in such a population.

PURPOSE
We aimed to determinate the impact of a precisely quantified MAC volume on one year cardiovascular (CV) mortality in patients with AS treated with TAVI.

METHODS
Patients from a national registry, which encompassed all consecutive patients treated with TAVI between 2010 and 2014 in four centers with a high TAVI volume, were included. MAC volume was quantitatively assessed on pre-TAVI computed tomography (CT) with a semi-automatic dedicated software. Patients with unavailable or poor-quality CT, and with mechanic mitral valve, were not included. MAC volume was considered either as a categorical variable (<2 cm³ or =2 cm³) for Kaplan Meier analysis (log rank test), or as a continuous variable for the Cox regression analysis. A multivariate Cox model adjusted for age, sex, atrial fibrillation (AF), peripheral artery disease (PAD), estimated glomerular filtration rate (eGFR), left ventricular ejection fraction (LVEF), coronary artery disease (CAD), vascular approach and aortic regurgitation (AR) post implantation =3/4 was performed to assess the impact of MAC volume on one year CV mortality.

RESULTS
1468 patients aged 83,5±7 years were included. 735 (50%) were women. Median eGFR was 47 mL/m² [35-61], 341 patients (23%) had PAD, 457 patients (32%) had AF. Mean pre-TAVI LVEF was 56%±14. Transfemoral approach was used in 1018 patients (69%). TAVI resulted in AR =3/4 in 17 patients (1,2%). The range of MAC volume was [0-11,8] cm³ but the distribution was very asymmetric: 149 patients (10,3%) had =2 cm³ MAC volume. 26 patients were lost to follow up. After one year follow up, 174 patients (12,1%) experienced a CV death, 149/1293 (11,5%) in patients with <2 cm³ MAC volume, and 25/149 (16,8%) in patients with =2 cm³ MAC volume (p Log Rank=0,04), as illustrated in figure 1. In univariate survival analysis, log of MAC volume was associated with CV mortality (HR 1,26 ; 95% confidence interval [1,03-1,54] ; p=0,02). In multivariable survival analysis adjusted for cofounders described above, log of MAC volume was still associated with an increased CV mortality (HR 1,28 ; 95% confidence interval [1,02-1,59] ; p=0,03).
CONCLUSION
MAC volume assessed quantitatively is a strong predictor of one year cardiovascular mortality after TAVI. It could be included in predictive model for decision making in patients with severe AS requiring TAVI.