

Topic 07 – Basic science

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Clinical impact of fractional flow reserve versus angiography for guiding percutaneous coronary intervention in patients with small coronary vessel lesions

Etienne Puymirat [Orateur] (1), Aaron Peace (2), Fabio Mangiacapra (2), Micaela Conte (2), Jozef Bartunek (2), Marc Vanderheyden (2), William Wijns (2), Bernard De Bruyne (2), Emanuele Barbato (2)

(1) AP-HP, Hôpital Européen Georges Pompidou, Cardiologie, Paris, France – (2) Cardiovascular Center Aalst, OLV Hospital, Aalst, Belgique

Background: True small vessels are supplying small myocardial territories therefore functional significance of correspondent lesions is questionable. Moreover, percutaneous coronary intervention (PCI) of not-functional small vessel lesions might be associated with worse clinical outcome. The aim of this study was to assess the clinical impact of Fractional Flow Reserve (FFR) versus Angiography for guiding PCI in the treatment of small coronary vessel lesions.

Methods and Results: From January 2004 to December 2008, all patients treated with PCI for stable or unstable angina in a native small coronary vessel (defined by a reference vessel diameter < 3mm) were enrolled. Patients were divided into two groups according to type of strategy used: Angio vs. FFR-guided PCI. A total of 717 patients were enrolled (495 Angio-guided PCI, 222 FFR-guided PCI). Clinical follow up was obtained in 97.5% (median follow-up 3.3±1.3 years). The proportion of patients treated with drug-eluting stent was similar in both groups. At five years, patients treated with FFR-guided PCI showed significantly lower death or non-fatal myocardial infarction (MI) (HR 0.41, 95%CI 0.23-0.75, p=0.004), target vessel revascularization (TVR) (HR 0.52, 95%CI 0.32-0.83, p=0.006) and major adverse cardiac events (MACE) (HR 0.46, 95%CI 0.31-0.68, p<0.001). No significant differences were observed between the two groups as to death and myocardial infarction. Costs of procedures were also reduced in FFR guided strategy (p<0.0001).

Conclusions: FFR-guided PCI is more effective than Angio-guided PCI in reducing death or non-fatal MI, TVR and MACE and in patients with small vessel disease.

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Long term prognosis impact of left ventricular systolic dysfunction in coronary artery disease

Frédéric Bouisset [Orateur] (1), Vanina Bongard (2), Jean-Bernard Ruidavets (3), Dorota Taraszkiwicz (4), Michel Galinier (1), Didier Carrié (5), Jean Ferrières (4), Meyer Elbaz (5)

(1) CHU Toulouse, Cardiologie A, Toulouse, France – (2) CHU Toulouse, Inserm U1027, Epidémiologie, Toulouse, France – (3) CHU Toulouse, Inserm U1027, Epidémiologie, Toulouse, France (4) CHU Rangueil, Cardiologie B, Toulouse, France – (5) CHU Rangueil, Cardiologie B, Toulouse, France

Purpose: Our objective was to assess the long term prognosis impact of LVEF in a contemporary large cohort of pts with established CAD.

Methods: Among 834 consecutive male pts hospitalized in 2001-2004 for coronary artery disease, LVEF was assessed in 716 pts. LVEF >0.50 was considered as normal. Values between 0.50 and 0.35 were considered as low, and LVEF ≤0.35 was considered as very low. The median follow-up was 7.17 years. Total mortality was predicted with a Cox proportional hazard model.

Results: Mean age (SD) was 60.2 (8.1), 144 pts (18.4%) were diabetic, 155 pts (19.8%) were smokers, mean blood pressure was 139 (20)/84 (11) mmHg and median heart rate was 61 bpm [Interquartile range (IQR)] [57-70]. Mean Cockcroft-Gault creatinine clearance was 87 ml/min and 11 pts (1.4%)

had a severe chronic renal failure (lower than 30 ml/min). 88.5% were on anti-platelet therapy, 75.2% on beta-blocker, 66% on statin therapy and 54.8% on ACE inhibitors or ARB. The sample comprised 413 (57%) pts with normal LVEF and 308 (43%) with systolic dysfunction (203 (65.9%) pts had a low and 105 (34.1%) a very low LVEF). Among the 308 pts with systolic dysfunction, 78.2% were treated with beta blockers and 72.7% with ACE inhibitors or ARB. The cumulative seven-year total mortality rate was 18.5% (8.6% in the normal LVEF group whereas it was 23.6% and 47.6% in the low and the very low LVEF groups, respectively, (p<0.001). After multivariate adjustment for age, diabetes, tobacco consumption, heart rate, duration of CAD, ankle-brachial index, history of chronic obstructive pulmonary disease or stroke, statin therapy and coronary revascularization, hazard ratio for of all-cause death was 2.51 (95% CI [1.59; 3.95] p<0.001) for low LVEF and 4.27 ([2.67; 6.84] p<0.001) for very low LVEF compared to pts with normal LVEF.

Conclusion: Left ventricular ejection fraction remains a strong and independent long term predictor factor for all-cause death in CAD, even in a contemporary well treated cohort.

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Global longitudinal strain in aortic stenosis according to NT-proBNP levels: identification of “falsely” asymptomatic patients

Laurent Macron [Orateur] (1), Pascal Lim (1), Alexandre Bensaid (1), Julien Nahum (1), David Attias (2), David Messika Zeitoun (2), Jean-Luc Dubois-Randé (1), Pascal Guéret (1), Jean-Luc Monin (1)

(1) AP-HP, CHU Henri Mondor, Cardiologie, Créteil, France – (2) AP-HP, CHU Bichat-Claude-Bernard, Cardiologie, Paris, France

Purpose: Early impairment of LV function using Brain Natriuretic Peptide (BNP) level has been proposed to stratify asymptomatic Aortic Stenosis (AS) with a poor outcome. Recent studies suggest that longitudinal global strain by speckle tracking may be useful to detect early stages of LV dysfunction. The purpose of the present study is to establish the relationship between longitudinal global strain and NT-proBNP value in the setting of asymptomatic AS.

Methods: The study included 128 patients (74±12 years; 59% men,) with moderate to severe AS (1.0±0.3 cm²) with preserved LVEF (>50%, 64±5%). Longitudinal global strain by 2D speckle tracking was compared to the presence of symptoms and plasmatic NT-proBNP measurement.

Results: On the whole, NT-proBNP averaged 723±1097 pg/mL and was higher in symptomatic patients (1203±1350 vs. 325±484 pg/mL, p<0.0001). However, elevated NT-proBNP level (>500 pg/mL) was observed in 18% asymptomatic patients (n=14/79). In asymptomatic patients, no difference was found for LVEF (65±5 vs. 63±4%), peak aortic jet velocity (3.5±0.8 vs. 3.9±0.9 m.s-1) or aortic valve area (1.1±0.4 vs. 1.0±0.4 cm²) between patients with and without elevated NTproBNP. Importantly, global longitudinal strain was significantly impaired in asymptomatic patients with elevated NT-proBNP (-17±4% vs. -19±3%, p<0.05) and did not differ from symptomatic patients (-17±3%).

Conclusion: Impaired longitudinal global strain in asymptomatic aortic stenosis is associated with an increase in NTproBNP level and may be used to better identify falsely asymptomatic patients.

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Long-term impact of repeat percutaneous mitral commissurotomy on the need for surgery in mitral stenosis. Insights from a series of 912 patients with a 20-year follow-up

Claire Boulet [Orateur], Bernard Iung, Dominique Himbert, David Messika-Zeitoun, Eric Brochet, Eric Garbarz, Bertrand Cormier, Alec Vahanian

AP-HP, CHU Bichat-Claude Bernard, Cardiologie, Paris, France

Purpose: Percutaneous mitral commissurotomy (PMC) can be repeated in case of mitral restenosis. However, the impact of repeat PMC on the possibility of deferring mitral surgery has not been specifically studied. We therefore analysed long-term follow-up (FU) after PMC, comparing survival without re-intervention (surgery or repeat PMC) to survival without surgery alone.