Progressive increase in ventriculo-arterial impedance is associated with LV dysfunction and adverse outcomes in patients with severe aortic stenosis

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Introduction: ventriculo-arterial impedance (ZV) is recognised as influencing exercise tolerance, sincoponset and prognosis in aortic stenosis (AS) patients

Aim: of the present study is to show that increase in ZV is associated with impairment of left ventricular (LV) function and adverse outcome in AS.

Methods: 218 patients (mean age: 79.9±8.6 years, males: 54%) with severe AS (aortic surface<1cm² or <0.6cm²/m²) underwent standard echocardiography to characterize aortic valve gradients, biventricular function and ZV. At follow-up, hospitalization for cardiac cause, heart failure and overall death were considered as major adverse cardiac events (MACEs).

Results: according to ZV, values our population was divided in four groups (Table 1). Progressive increase in ZV was associated with a progressive reduction in LV ejection fraction (LVEF), mitral S', indexed stroke volume (SVi) and LV global longitudinal strain (GLS). At Kaplan-Meyer survival analysis, a ZV >3.43 mmHg/ml/m², as observed in Group B, C and D, patients, was associated with a poor prognosis (Log-Rank test, p=0.02)

Conclusions: in patients with severe AS, progressive increase in ventriculo-arterial impedance has a negative impact on LV performance, and a mild elevation in ventriculo-arterial impedance is associated with a poor prognosis.

0112

Determinants and prognostic impact of left ventricular contractile reserve in asymptomatic aortic stenosis

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Background: The management of asymptomatic patients with severe aortic stenosis (AS) is extremely controversial. There are very few data regarding the assessment, determinants and prognostic value of left ventricular contractile reserve (LVCR) in these patients. We aimed to quantify LVCR and to evaluate its determinants and usefulness for risk stratification in asymptomatic patients with severe AS.

Methods and results: Asymptomatic patients with severe AS (n=150), aortic valve area<1cm², 70±9 years, 64% of male) and preserved left ventricular (LV) systolic function (LV ejection fraction ≥55%) were prospectively referred to exercise stress echocardiography. Using 2D speckle tracking analysis, LVCR was defined as an exercise-induced changes in LV global longitudinal strain ≥2%. LVCR was present in 62 patients (41%) and there was no significant difference between LVCR and no LVCR groups regarding demographic, clinical and exercise data, as well as risk factors. Using multiple linear regression, after adjustment for age, sex and E/Ea ratio, the independent determinant of exercise-induced changes in LV global longitudinal strain were aortic mean pressure gradient (p=0.005), LV ejection fraction (p=0.035) and exercise indexed LA area (p=0.002). During a mean follow-up of 19±12 months, 76 events (51%) occurred. The absence of LVCR was associated with reduced 4-year cardiac event-free survival (26±6 vs. 53±11%, p<0.0001). By opposition, exercise-induced changes in LV ejection fraction did not predict the outcome (p=0.96). In multivariate analysis, the independent predictors of events were resting brain natriuretic peptide level (p<0.0001), aortic mean pressure gradient (p=0.037), exercise cardiac output (p=0.004) and absence of LVCR (HR=1.8, 95%CI: 1.05-3.08, p=0.033).

Conclusion: In asymptomatic patients with severe AS, the main determinants of LVCR, as assessed using exercise-induced changes in LV global longitudinal strain, were related to AS severity and exercise LA size. The absence of LVCR is a powerful predictor of reduced cardiac event-free survival. These results strongly support the use of exercise stress echocardiography in asymptomatic AS.

0147

Prognostic value of NT-proBNP in Algerian patients with asymptomatic aortic stenosis

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Introduction and objectives: Aortic stenosis (AS) is the most common valve disease. Aortic valve replacement (AVR) is the treatment of choice in symptomatic patients with severe AS. Our objective was to assess the prognostic value of NT-proBNP in Algerian patients with asymptomatic moderate/severe aortic stenosis.

Methods: Prospective study of 225 patients with degenerative asymptomatic moderate/severe aortic stenosis. NT-proBNP was determined in all patients, who were then followed up clinically. A clinical event was defined as surgery, hospital admission due to angina, heart failure or syncope, or death.

Results: A total of 51% were women, and the mean age was 74 years. Mean (SD) echocardiographic values were as follows: peak velocity 4.14 (0.87) m/s; mean grade, 43.2 (16.0) mmHg; aortic valve area, 0.87 (0.72) cm²; and aortic valve area index, 0.49 (0.14) cm²/m². The median NT-proBNP value was 490.0 (198.0-1312.0) pg/mL. There were 139 events during follow-up (median 12 months). The optimum NT-proBNP cut-point was 515 pg/mL, giving event-free survival rates at 6 months and 1 years of 93% and 57%, respectively, in patients with NT-proBNP <515 pg/mL compared with 50% and 31% in those with NT-proBNP >515 pg/mL.

Conclusions: NT-proBNP determination provides prognostic information in patients with asymptomatic moderate/severe aortic stenosis.
Objectives: We sought to evaluate the effect of AF on the immediate and long-term (23 years) outcome of patients undergoing BMV.

Methods: The immediate procedural and the long-term clinical outcome after BMV of 139 patients with AF were collected and compared with those of 381 patients in normal sinus rhythm (NSR).

Results: Patients with AF were older (43.3 vs. 29.7 years; p < 0.001), had frequently a history of systemic embolism (9.4% vs. 1.6%; p < 0.001) and of mitral commissurotomy (28.1% vs. 19.4%; p=0.035). Patients with AF had more frequently a Wilkins score > 8 (51.4% vs. 30.9%, p < 0.001), a larger left atrium (41cm² vs. 32cm², p=0.001) and a lower transmural gradient (11.1 mmHg vs. 16.6 mmHg, p < 0.001).

BMV was equally successful in the two groups (90.6% vs. 94%, p=0.187) but resulted in a smaller post BMV area (2cm² vs. 2.15cm², p=0.012) with a lower mitral valve area gain (9.0cm² vs. 1 cm, p=0.015). BMV was not associated with a higher risk of complications (4.3% vs. 4.7%, p= 0.844).

After a mean follow-up of 74 months, patients with AF had the same rate of restenosis (28.3% vs. 25.6%; p=0.96) but required more frequently a mitral valve replacement (16.3% vs. 7.7%, p= 0.012). They also experienced higher rates of systemic embolism (3.8% vs. 0.6%, p=0.018) and had a lower rate of event free survival (52.2% vs 68.8%, p = 0.047). In the group of patients in AF, predictive factors for combined adverse events including death, restenosis, and systemic embolism. Predictive factors of mitral valve replacement are: post BMV area < 2cm² (OR: 2.5, 95% CI

BMV was not associated with a higher risk of complications (4.3% vs. 4.7%, p= 0.844).

0351

French experience in tricuspid valve-in-valve implantation for bioprosthetic valve failure

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Tricuspid valve-in-valve (VIV) implantation has recently emerged as a possible therapeutic option when a bioprosthetic valve degenerates. A French retrospective study is reported.

From 2010 to end 2014, 9 patients underwent tricuspid VIV implantation. There were 4 females and 5 males. Pts were in functional NYHA class III. Seven pts had congenital heart disease, 1 pt a rheumatic disease, 1 pt a cardiomyopathy. Causes for implantation were tricuspid stenosis (n = 4), a mixed lesion combining tricuspid stenosis and regurgitation (n = 4), and one tricuspid regurgitation. In addition, 2 of them suffered from protein losing enteropathy (PLE). Implantation was performed under general anaesthesia using a femoral access in all pts. Implantation succeeded in all pts.

Conclusion: Our data support the fact that patients with AF have worse immediate and long term outcomes after BMV. Post BMV area <2cm², procedural complications and dyspnea predict adverse events during follow up.

0407

Evaluation of the tricuspid annulus size: clinical implications from comparison between 2D-transthoracic and 3D-transesophageal echocardiography

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Background: Tricuspid annuloplasty is recommended during left-heart valve surgery when tricuspid annulus (TA) is dilated, independently of the degree of tricuspid regurgitation, but the methodology to measure TA and thresholds of TA enlargement for routine practice.

Methods: 2D-TTE measurement of the TAD was performed in para-sternal long-axis view of the right ventricle inflow, parasternal short-axis, apical 4-chamber (A4C) and sub-costal views in 195 prospectively enrolled patients and 66 healthy volunteers. 3D dynamic volumetric data of the TA were also acquired by TEE using a matrix array transducer (X7-2t, Philips) in the 195 patients. Multiplanar reconstructions were performed offline using dedicated software (QLab7, Philips) to measure the long-axis (LA) of the TA.

Results: In the 195 patients, TAD measurements were not different between 2D-TTE and 3D-TEE in the 4 different views to three-dimensional measurements performed during transesophageal echocardiography (3D-TEE) and to define thresholds of TA enlargement for routine practice.

0398

Predictors of functional tricuspid regurgitation after successful left-sided valve surgery

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Introduction: Functional tricuspid regurgitation (TR) is probably the most common and anticipated complication of left-sided heart valve pathology, especially mitral valve diseases. Whether prooperative functional TR will regress or progress after successful left-sided valve surgery is unknown. The aim of this study was to identify the predictors of significant TR after successful left-sided valve surgery.

Methods: A retrospective analysis was performed on a total of 56 patients who underwent left-sided valve surgery (mitral or mitro-aortic valve surgery).

All patients had complete clinical examination and echocardiographic studies preoperatively and clinical and echocardiographic follow-up post-operatively.

Results: Mean operative age of patients was 49.3±13.7 years with a sex ratio of 0.8. Tricuspid annuloplasty was associated to left-sided valve surgery in 18 (32%) patients. Postoperatively, significant TR was found in 13 patients (23%) with a mean follow-up of 20.5±33 months. Patients with significant postoperative TR were more often female (83% vs 48%; p = 0.03), had more often a previous mitral commissurotomy (58% vs 23%, p=0,02) and showed a higher prevalence of significant preoperative TR (69% vs 42%; p=0.04). Postoperatively, residual pulmonary hypertension (p=0.04), dilatation of left atrium (p=0.02) and dilatation of right cardiac cavities (p=0.01) were significant risk factors for development or progression of TR after surgery.

Conclusion: Late onset or progression of functional TR after successful left-sided valve surgery is a significant clinical entity as it displays a great impact on patient prognosis. So, the identification of clinical and echocardiographic predictors of late TR allows an adequate screening of patients that will require tricuspid valve repair at the time of initial left-sided valve surgery.

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