ABSTRACTS OF THE 19TH CONGRESS OF ECHOCARDIOGRAPHY

Poster session: Stress echocardiography/Transesophageal echocardiography

Transvalvular impedance modification during exercise echocardiography
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\textbf{Purpose}.— To analyse the relationship between changes in the transvalvular impedance signal (TVI) and echocardiographic markers of cardiac hemodynamics, during physical stress.

\textbf{Methods}.— A semi-supine self-limited exercise echocardiography was performed in eight consecutive patients (mean age: 72 ± 8 years, three males) implanted for standard indications with a dual-chamber pacemaker equipped with the TVI sensor (Sophos 155). Left ventricular (LV) volumes were measured using the biplane Simpson method. Pulsed-wave Doppler and Tissue Doppler Imaging were used to quantify mitral E wave and mitral annulus Ea wave respectively. At rest and exercise, E/Ea ratio was used to assess the LV filling pressure. Concomitantly, the TVI waveform was derived and processed by the implanted pacemaker. TVI increases in systole and decreases in diastole, suggesting an inverse relationship with the ventricular volume.

\textbf{Results}.— At peak exercise, sinus rate and aortic VTI were increased, respectively, by 31 ± 13 bpm and 16 ± 12% versus the resting levels. The enhanced LV stroke volume was mainly the result of an increased LV end-diastolic volume (EDV: +17 ± 13 ml), while the LV end-systolic volume showed not significant changes (+2 ± 10 ml). The preload increase under stress was further confirmed by the increased peak velocity of mitral E-wave (+50 ± 55%). During stress, E/Ea ratio decreased in five patients and increased in the remaining. Physical exercise induced an increase in the peak-peak amplitude of the TVI waveform, concomitantly to a decrease in E/Ea ratio. In contrast, the TVI signal amplitude was decreased in patients with increased E/Ea. The stress-induced changes in TVI wave and E/Ea ratio were well correlated (R\textsuperscript{2} = 0.76). The end-diastolic TVI was reduced during exercise in all patients, and its relative modification was inversely correlated with the relative change in LVEDV (R\textsuperscript{2} = 0.73).

\textbf{Conclusion}.— The TVI waveform is sensitive to LV diastolic volume and filling pressure, as assessed by transthoracic echocardiography.

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Transesophageal echocardiography, an unusual trigger to Takotsubo cardiomyopathy: A case report
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We report a case of Takotsubo cardiomyopathy (TC) occurring after a transesophageal echocardiography (TOE). TC is a recently described syndrome characterized by transient left ventricular (LV) dysfunction, mimicking ST-segment elevation myocardial infarction in its presentation, without obstructive coronary artery disease. Although the aetiology of TC syndrome remains obscure, stress appears to be the principal trigger. It is more common in middle-aged women, and the prognosis is favourable. TOE is considered as a semi invasive exam, but widely performed for cardiovascular evaluation with a relatively good tolerance and a very low rate of complication. We describe the case of a 65-year-old female patient who underwent a TOE and developed afterward a TC. To the best of our knowledge, this is the first case describing TC following TOE.

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Large ischaemia during stress echocardiography and normal coronary angiography
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After a positive stress echocardiography (stress echo), a coronary angiography is usually performed. When no significant lesion is found, the result is considered as a “false positive” test. Nevertheless, in some cases, new wall motion abnormality (WMA) during stress echo is large and clearly present for different observers. The aim of the present study was to evaluate the occurrence of large WMA during stress echo with normal coronary angiography in routine clinical practice.

\textbf{Methods}.— All patients referred for coronary angiography after a positive stress echo in our centre between April 2008 and October 2009 have been selected for the study. Stress echo were blindly analysed by two observers in order to specify the number of ischemic segments (new or worsening WMA).

\textbf{Results}.— Three hundred and seventy-nine patients (75% men, mean age 66 ± 10 years) have been included in the study. Mean number of ischemic segments at peak stress echo was 4 ± 1.5. Coronary artery stenosis > 50% (visual analysis) was present in 222 patients (85%). In 178 patients, stress echo was positive in a large area...
Exercise adaptation of the left ventricular myocardium in men over 50 years of age

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Aims. — We intend to describe the remodelling that occur due to intensive athletic activity in men ≥ 50 years of age.

Methods. — We conducted a prospective analysis of 21 athletes ≥ 50 years of age. Fifteen sedentary healthy controls and ten patients diagnosed with a left ventricular hypertrophy who were all over the age of 50. All subjects underwent a resting and a sub-maximal exercise echocardiography in order to measure left ventricular systolic and diastolic functions.

Results. — Left ventricular (LV) volumes, which were similar at rest in the three groups, were higher in the athletes during exercise (P < 0.01). Systolic ejection volumes and longitudinal global left ventricular strains were greater at rest in healthy subjects (athletes and controls) in comparison to those in LVH-patients (P < 0.01). During exercise, the increase in longitudinal strain was higher in athletes than in the two other groups (P < 0.05). Concerning left ventricular relaxation, septal e’- and lateral e’-waves were higher both at rest and during exercise in the group of healthy subjects in comparison to those in patients (P < 0.05).

Conclusion. — Distinguishing physiology from pathology is challenging at rest, particularly in the elderly. However, exercise stress echocardiography helps. Only the changes in shape and in the longitudinal LV systolic function during exercise are significantly different between athletes and controls or LVH-subjects.

Prevalence of coronary artery spasm during dobutamine stress echocardiography

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Background. — Previous care reports have suggested that dobutamine stress echocardiography may induce coronary artery spasm. The aim of this study was to assess the prevalence of coronary artery spasm during dobutamine stress echocardiography.

Methods. — Over a nine-year period (from November 2001 to October 2010), we reviewed all patients (n = 2,224) referred for dobutamine stress echocardiography. Criteria for selection included patients aged ≥ 18 years and with dobutamine stress echocardiography. We systematically analysed all ECG performed during dobutamine stress echocardiography, allowing to detect ST elevation during the examination. All patients with ST elevation underwent a coronary angiography.

Results. — A dobutamine stress echocardiography was performed in 2,224 patients. In 20 patients, a ST elevation was observed (always in inferior leads) and all these patients underwent an urgent coronary angiography. In 13 patients (65%), a significant coronary stenosis was observed: ST elevation was observed in case of critical coronary stenosis in six patients and in case of chronic coronary occlusion in seven patients. Finally, seven patients (35% of patients presenting with ST elevation during dobutamine stress echocardiography; six men, mean age: 67 ± 11 years) had no significant coronary stenosis. The prevalence of coronary artery spasm during dobutamine stress echocardiography was 0.3%. In the last patient who presented with this clinical presentation, we induced a coronary artery spasm during coronary angiography with dobutamine perfusion and a second coronary angiography confirmed the diagnosis of coronary spasm after methergin testing.

Conclusion. — Coronary artery spasm during dobutamine stress echocardiography is rare but may occur. Its prevalence is estimated at 0.3%. Physicians should be aware of its presence in dobutamine stress echocardiography.

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