Session 3 – Cardiovascular Multimodality Imaging Techniques

Thursday May 28 – 15.30 – 16.00

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Diagnostic value of post-systolic Index in non-ST-segment elevation acute coronary syndrome without regional wall motion abnormality

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Background Post systolic shortening offers a sensitive marker of myocardial ischemia. We tested the ability of Post systolic Index (PSI) by speckle tracking echocardiography to identify significant coronary stenosis in patients with non-ST-elevation acute coronary syndrome (NSTE-ACS) without regional wall motion abnormality.

Methods Thirty two patients referred to coronary angiography due to suspected non-ST-segment elevation acute coronary syndromes (NSTE-ACS) were prospectively included. Coronary occlusion was found in 04, significant stenosis in 18, and no stenosis in 10 patients. Echocardiography was performed 1 to 2h before angiography. Patients with left ventricular dysfunction or regional wall motion abnormality were excluded. Myocardial PSIs and strains of 17 myocardial segments were measured by 2-dimensional (2D) speckle tracking echocardiography.

Results According to ROC curve analysis (area under ROC curve=0.81), an area of 2 adjacent dysfunctional segments (Post-systolic index greater than or equal to 20) had the best ability to identify patients with acute coronary occlusion or significant stenosis, with sensitivity 60% and specificity 96%.

Conclusion Mesurement of PSI by speckle tracking echocardiography identifies NSTE-ACS patients with acute coronary occlusion or significant stenosis, who may benefit from urgent reperfusion therapy.

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Cardiac hydatid cyst: About 110 cases

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Introduction Cardiac hydatid disease is rare. It is a potentially serious condition to its location and its complications. The natural evolution is pejorative and surgical resection remains the only alternative.

Objective Analyze the diagnostic and therapeutic aspects of the disease.

Materials and methods Retrospective descriptive study of patient records who underwent cardiac hydatid cyst surgery in a cardiac surgery center in Algiers from 1986 to December 2014.

Results 110 cases of cardiac hydatid cysts were collected. Patients aged from 6 to 72 years. Echocardiography is the gold standard preoperatively exam. The use of CT and/or cardiac MRI was reserved to the complicated forms or multiple cardiac or secondary location. The ruptured forms represent about 20% of cases with systemic or pulmonary embolic complications. Approximately 30% of cardiac locations are secondary as part of a multi visceral involvement.

The left ventricle is the site of predilection (30%). Multiple intracardiac locations are non negligible (14%).

The results of surgery are excellent with a mortality of 2.7% and a recurrence rate of 1.8% interesting ruptured cysts.

Conclusion Cardiac hydatid is rare but serious disease. It must be systematically searched in the cases of any extracardiac location. Echocardiography is the gold standard preoperatively exam in the uncomplicated forms.

Surgery remains the only therapeutic alternative with good short and long term results.

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Accuracy and limits of multi-detector computed tomography coronary (MDCT) in the detection of coronary artery disease (about 105 cases)

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Introduction Non-invasive examination of coronary artery disease is an attractive and rapidly evolving possibility. Multi-detector computed tomography coronary (MDCT) is currently considered as a promising technique alternative to conventional coronary angiography (CCA).

Purpose The purpose of our study is to determine diagnostic accuracy and limits of 64-slice MDCT in the detection of coronary artery disease (CAD).

Methods 105 patients underwent 64-slice MDCT. Coronary angiography was performed every time when the MDCT was pathologic. In two cases the MDCT was realized in complement of inconclusive coronary angiography.

Study of coronary arteries was based on “per-segment” and “per-patients” analyse and we proceeded to calculate sensitivity, specificity, positive and negative predictive value.

Results The mean age was 63.3 years, sex ratio was 0.7. Hypertension was noted in 63% of cases, 29.9% of patients had mellitus diabetes.

The initial clinical presentation was unusual chest pain in 46 patients, exercise chest pain in 40 cases. The MDCT was done for the detection of silent ischemia In 5 cases, for screening of CAD in patients with dilated cardiomyopathy in 5 cases, before cardiac surgery in 3 case and before non cardiac surgery in 2 cases. MDCT was normal in 30 patients (28%) so coronary angiography was avoided in 60% of patients with unusual chest pain, and in 50% of patients with dilated cardiomyopathy and in also in 50% of patients selected for cardiac or non cardiac surgery.

In per-segment study the sensitivity, specificity, positive and negative predictive value of the MDCT in detecting coronary stenosis were respectively 89%,98%, 91% and 97% versus, 98%, 89%, 94%, 95% the per-patient evaluation.

The MDCT as inclusive because in10 patients of calcifications in 8 cases and because uncontrolled cardiac heart.

Conclusion Our results for negative predictive value of MDCT are similar to reports from the literature. This suggests that in clinical setting MDCT may replace coronary angiography. In patients with low probability of coronary artery diseases, its is also useful for assessment of cardiomyopathy and before cardiac or non cardiac surgery.

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Coronary calcium in two segment elevation acute coronary syndrome

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Introduction Coronary artery disease is the first leading cause of death in hemodialysis patients. In this population, cardiovascular calcifications...
occur at an earlier age and are growing faster than in the general population.

**Patients and methods** Forty-nine patients on chronic hemodialysis, 26 men and 23 women, mean age 56.4 years, with an mean hemodialysis duration of 85 months, underwent screening for coronary calcifications (CC) by an ultrafast 64 multislice cardioscanner, and an evaluation of the systolic ejection fraction of the left ventricle (LVEF) by transthoracic echocardiography after dialysis.

**Result** CC were detected in 69.4% of the cases with a preferential localization in the anterior interventricular artery (69.4%). CC were associated with conventional cardiovascular risk factors (age, male sex, systolic blood pressure, diabetes, history of ischemic heart disease). The average of coronary calcium score was 331.1, and 522.2 in the 10 patients treated for ischemic heart disease (p=0.09). Comparing groups with and without CC, there is no significant difference in LVEF (60.5% vs 65.9%, p=0.135).

**Discussion** Our study shows that CC in dialysis does not affect LV systolic function even if they share several cardiovascular factors with coronary atherosclerosis. Indeed, the pathogenesis of CC in dialysis is complex and multifactorial and is essentially reflected by calcic deposition in intima or mediacalcosis that are often asymptomatic. In advanced cases, the CC may be the bed of atheromatous lesions that may lead to ischemic lesions where the value of early detection.

**Conclusion** Our study confirms the high prevalence of CC patients receiving hemodialysis. Although there is no relationship between CC and LVEF in our series, the CC remains a major predictor of cardiovascular morbidity and mortality in dialysis patients.

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**21 Three-dimensional transesophageal echocardiography for cardiac output in intensive critically ill patients: a preliminary study ultrasound versus thermodilution method**

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**Purpose** Cardiac output (CO) is an important information required to hemodynamic management of intensive care unit (ICU) patients. Three-dimensional trans-oesophageal echocardiography (3D-TEE) is a new noninvasive ultrasound modality for quantitative semi-automated assessment of left ventricular (LV) volumes and ejection fraction.

The objective of the study was to evaluate 3D-TEE applied to the estimation of CO using thermodilution as the reference method in ICU mechanically ventilated patients.

**Methods** Fifteen ICU mechanically ventilated patients prospectively underwent PiCCO catheter implantation and 3D-TEE. From 3D-TEE LV dataset, LV end-diastolic and LV end-systolic volume were determined using a semi-automated software. CO was calculated as the product of LV stroke volume (end-diastolic, end-systolic volume) and heart rate. CO was also determined invasively by transpulmonary theromodilution as reference method.

**Results** Among 30 hemodynamic evaluations performed in the population, 29 (97%) LV 3D-TEE datasets were suitable for CO calculation. The mean 3D-TEE image acquisition and post processing times were 46 and 125 seconds respectively. There was a good correlation (r=0.78) between PiCCO and 3D-TEE estimated CO. The 3D TEE CO mean bias was 0.38 L/min with −1.97 to 2.74L/min limits of agreement.

**Conclusion** Noninvasive estimation of CO by 3D-TEE is feasible in ICU mechanically ventilated patients. This new semi-automated ultrasound tool has a relatively good agreement with thermodilution method. 3D-TEE appears to be an additional valuable tool for noninvasive assessment of CO in ICU patients.