Results: Mitral valve area increased from 0.88±0.16 to 1.55±0.26 cm² (p<0.0001). Mean mitral valve gradient (MVG) decreased from 16±6 to 6±2 mmHg (p<0.0001) immediately after BMV. The RV-right atrium (RA) pressure gradient decreased from 57±25 to 42±13 mmHg (p<0.0001) and PVR fell from 2.53±0.92 to 1.86±0.43 Wood units (p<0.0001). There was no significant change with regard to TDI S velocity, RVFAC, IVRT and Tei index. There was a significant increase in TAPSE (p=0.01 immediately after BMV; p=0.0006 at one month) which was correlated with the decrease in PVR, RV-RA pressure gradient and MVG. This improvement occurred only in patients with valve area >1.5 cm² after BMV.

Conclusion: Successful BMV results in a significant improvement of RV systolic function assessed by TAPSE in patients with mitral stenosis in sinus rhythm and with mitral valve area >1.5 cm² after BMV.

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Importance of left ventricular remodelling and regional function in the occurrence of ischemic mitral regurgitation

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Introduction: Mitral regurgitation developing in the course of myocardial infarction significantly worsens survival. The aim of this study is to determine the relative importance of the global and regional left ventricular (LV) remodelling in the occurrence of ischemic mitral regurgitation (IMR).

Methods: 81 patients (mean age = 61±11 years) admitted with acute myocardial infarction (AMI) were screened. Patients with atrial fibrillation and organic valvular diseases were excluded from the study. Echocardiography (two-dimensional and Doppler echocardiograms) was performed in the first week after admission. The 81 patients were divided in 2 groups: with IMR (group1 = 39 patients) and without IMR (group2 = 42 patients). LV volumes were calculated by apical biplane Simpson’s rule. The LV wall-motion score (WMS) index was obtained in a 17 segment model according to established methods. To identify the influence of regional wall-motion impairment for each individual LV segment, the mean WMS was calculated for each segment and compared between the 2 groups.

Results: The echocardiographic parameters that were associated with IMR were: LV dilatation and sphericity (p<0.0001), reduced ejection fraction (p<0.0001), inferior (p<0.001) inferolateral (p<0.01) and anterolateral (p=0.02) asynergy.

Conclusion: the results of this study indicate the importance of abnormalities of both LV geometry and regional wall motion in the pathogenesis of IMR after myocardial infarction. Clinically, these findings imply that myocardial salvage by early coronary revascularisation may improve outcome by preserving LV function and decreasing the incidence of IMR.

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Superiority of CT scan over transthoracic echocardiography in predicting aortic regurgitation after TAVI.

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Background: Paravalvular aortic regurgitation (AR) occurs in up to 86% of patients undergoing Transcatheter Aortic Valve Implantation (TAVI). Its prevalence remains unchanged after one year follow-up but its determinants are unclear. We sought to evaluate the impact of annulus measurement by transthoracic echocardiography (TTE) and by CT scan on the occurrence of AR.

Methods: The study included 43 symptomatic patients (83±8 years, 72% in NYHA II/III) with severe aortic stenosis [0.76±0.19cm², mean gradient 42±14mmHg] who underwent TAVI using CoreValve® LLC Percutaneous Aortic Valve Implantation System, Medtronic, Minneapolis USA. Left ventricular outflow tract (LVOT) area was computed from LVOT diameter (21±2mm) by TTE using a spherical model and from CT using an ellipsoidal model according to the larger (25±3mm) and the smaller outflow tract diameters (22±3mm). These data were compared to the prosthesis area and the occurrence of AR after TAVI.

Results: In patients with AR greater or equal to 2/4 (32%), LVOT area measured by CT was significantly greater as compared to patients with no or mild AR (478±65mm² vs. 411±85 mm², p=0.009). Furthermore, the difference between actual prosthesis area and LVOT area measured by CT scan was significantly smaller (113±55 vs. 171±67, p=0.009) in patients with significant AR (≥2/4) after TAVI. In contrast, LVOT area from TTE did not correlate with AR severity.

Conclusion: CT scan is more accurate than TTE for calculating LVOT area for prosthesis sizing before TAVI in order to avoid post-implantation AR.

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Assessment of contractile reserve using strain delay index by speckle tracking to identify myocardial viability

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Background: In dysfunctional segment, contractility in delayed segments does not fully contribute to end-systolic function. This reserve of contraction (strain delay index) related to mechanical dyssynchrony is supposed to be greater in viable and ischemic segments than in infarct segments.

Methods: Percutaneous coronary occlusion (circumflex) was performed in 13 anesthetized pigs to investigate changes in strain delay index during acute ischemia (after 3° of occlusion) and after induced myocardial necrosis (>2 hours of occlusion). The strain delay index, which was defined as the difference between peak and end-systolic strain was computed from circumferential and radial strain curves obtained by speckle tracking analysis performed on short axis view.

Results: In related coronary occluded segments, delayed myocardial contraction and impaired regional peak strain was observed during early ischemia for circumferential and radial strain. However, despite prolonged coronary occlusion, delayed contraction and peak circumferential and radial strain remained unchanged. In contrast, regional strain delay index showed a biphasic pattern with an increased during early ischemia and a significant decrease after a prolonged coronary occlusion.

Conclusions: Delayed myocardial contraction and reduce peak strain by speckle tracking can be similarly observed during early and prolonged coronary occlusion. In contrast, regional strain delay index used to quantify contractile reserve appears to more sensitive to identify myocardial viability.

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