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Systolic function assessed by TAPSE in patients with mitral stenosis in sinus

Hedi Baccar, N. Haddad, Slim Sidhom, Riadh Kasri, Ali Belhani

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119

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) remod-
elling in the occurrence of ischemic mitral regurgitation (IMR).

Methods: 81 patients (mean age = 61±11 years) admitted with acute myo-
cardial 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)
asynchrony.

Conclusion: the results of this study indicate the importance of abnormali-
ties 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 pre-
serving LV function and decreasing the incidence of IMR.

120

Superiority of CT scan over transthoracic echocardiography in pre-
dicting aortic regurgitation after TAVI.
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Lim (1), Julien Nahum (1), Laurent Macron (1), Xavier Troussier (1),
Jean-Francois Deux (2), Emmanuel Teiger (1), Pascal Gueret (1), Jean-
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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
sequential AR.

Methods: The study included 43 symptomatic patients (83±8 years, 72% in
NYHA 2/3) 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 ventric-
ular 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 diamete-
ters (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 sig-
ificantly 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.

121

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 dysynchrony 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 differ-
ence 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 con-
traction 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 coro-
nary occlusion. In contrast, regional strain delay index used to quantify con-
tractile reserve appears to more sensitive to identify myocardial viability.