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Background: The use of flexible rings has been proposed in mitral valve repair in order to preserve the annular dynamics which might be limited by rigid rings.

Purpose: To compare in humans the effect of different rings on the dynamics of mitral annulus and aortic-mitral junction in the setting of mitral repair for degenerative insufficiency.

Methods: 10 pts (age: 60.9±) undergoing mitral valve repair (quadrangular resection of posterior leaflet and annuloplasty) were divided into two groups according to the ring adopted: Group 1, flexible rings (Tailor or Sovering); Group 2, semi-rigid rings (Seguin). A transesophageal three-dimensional reconstruction of mitral annulus was performed on the same day after surgery. In both groups we compared the 3D echocardiographic indices of annulus geometry: maximum and minimum "anulus area" (MAA), maximum and minimum "septal-lateral" and "inter-commisural" diameters (SPD, ICD), eccentricity index (EI, ratio between septal lateral and intercommisural diameters, SL/DIC) and systolic expansion of aorta (defined as increase of systolic expansion of > 30% throughout the cardiac cycle).

Results: The results are summarized in the table. We noted in Group 1 a more significant shortening of septal-lateral diameter and a better preserved aortic expansion (-30%).

<table>
<thead>
<tr>
<th>Method</th>
<th>MAA (max-min)</th>
<th>SPD (max-min)</th>
<th>ICD (max-min)</th>
<th>EI (max-min)</th>
<th>Ao expansion</th>
</tr>
</thead>
<tbody>
<tr>
<td>GR 1</td>
<td>1.8± 0.4</td>
<td>0.8± 0.3</td>
<td>0.4± 0.4</td>
<td>0.2± 0.5</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>GR 2</td>
<td>1.2± 0.4</td>
<td>0.3± 0.2</td>
<td>0.3± 0.2</td>
<td>0.4± 0.4</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

p < 0.05

Conclusion: Data suggest that the flexible rings allow maintenance of the physiological shape of the mitral annulus and the dynamics of mitral-aortic valve interaction leading to systolic expansion of ascending aorta ("pushing effect") which was not observed with rigid rings. Further studies will be necessary in order to assess the clinical implication of these findings on the long-term valve function and aortic mechanics after repair.

Contrast enhanced live 3D echo in acute myocardial infarction determines accurate left ventricular wall motion and volumes compared to cardiac MR imaging.

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LV volume and functional assessment in acute myocardial infarction is complicated by the time course of stunning and myocardial necrosis leading to geometric variations of regional akinesia or aneurysm. The aim of the study was to assess the differences of a matrix three dimensional echocardiographic volume and global functional analysis compared to magnetic resonance imaging.

Methods: Twelve patients (mean age 54 yrs, range 40 to 72) with an acute myocardial infarction after interventional revascularisation within the last 24 to 48 h were included in the study. All patients were scanned on a Sonos 7500 matrix array transrhoracic ultrasound scanner using a double bolus contrast injection technique using Sonos/Vue (Bracco). MR studies were performed on a Siemens Sonata scanner initially and repeated after one week. Ventricular volumes and wall motion were determined by two experienced observers using a TomTec 5.0 Imaging 3D worksta.

Echo 3D technology could be easily performed in adult cardiac pts providing unique imaging planes and projections. Instant acquisition and rendering of 3D images facilitates recognition of cardiac structures and increase diagnostic potential of transthoracic echocardiography.

Diagnostic contribution of routine 3-dimensional echocardiography in valvular heart disease.

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3-dimensional echocardiography (3DE) is a rapidly evolving echocardiographic technique, helpful in difficult cases when 2-dimensional echocardiography (2DE) cannot deliver required information due to complex spatial relationships in diseased heart or inability to obtain a desired cross-sectional view. The aim of this study was to assess the potential and limitations of 3DE in valvular heart disease incorporated in the routine workflow of academic echo-tube.

Methods: Over a 5-year period 3DE was applied to selected clinical population with valvular heart disease when routine study provided insufficient information according to referring physician. Retrospective analysis of our database provided data of 63 3DE studies performed with TomTec Echocan 3.1 using rotational device and TomTec Easyscan 4.0 from transsthoracic (16 patients) or transesophageal (47 patients) window. ECG and respiratory gating was used for data acquisition. The final unique imaging plane was made by 3DE cardiac cycles, which corresponded to 2-5 degree rotational interval (Echo Scan 3.1) or using 30-50 cycles with 4D EasyScan (freehand scanning).

Results: A total of 139 3DE acquisitions were performed (average 2.2 per patient). Quality of resulting 3D image was graded as 0 - bad (4%), 1 - satisfactory (16%), 2 - good (33%), 3 - demo (47%). Average quality of reconstruction was 2.2±0.8. Comparing to 2DE, additional morphologic or quantitative information was obtained in 41% of patients (50% TTE and 38% TEE), including improved assessment of aortic valve morphology and area, anlypse mode planimetry of tricuspid and mitral valve and detailed assessment of mitral valve prolapse. No major benefit was seen during the pulmonary valve.

Conclusion: 3DE can be incorporated in routine diagnostics of valvular heart disease with high feasibility rate. TTE or TEE based 3DE is a valuable tool in clinically indicated cases providing additional qualitative or quantitative information in 41% of valvular heart disease cases.