Methods: Pre- and postprocedural MSCT was performed in 40 patients. TAVI size selection was done on the basis of annulus cross sectional measurements by MIRACUS that assure the nominal TAVI device CSA always exceeded the annulus CSA. In preprocedural data sets we determined the valve calcium score, the CSA and the ovality index of the aortic annulus. In postprocedural data sets maximum and minimum diameter and the degree of circularity at three levels (ventricular end, anulus, aortic end) was determined.

Results: The average expansion ratio of the Edwards Sapien XT device was 95% and the circularity Index was 97%. In multivariate regression analysis neither calcium score nor ovality index of the native annulus were associated with under or non circular expansion of the device. The only parameter predicting underexpansion was the degree of oversizing. Underexpansion of the device was not associated with increased transaortic pressure gradients or with the incidence of paravalvular aortic regurgitation. The degree of oversizing was however positively associated with the incidence of new conduction disturbances. In the entire cohort no aortic regurgitation > mild was observed.

Conclusions: MSCT guided TAVI device sizing is associated with almost complete and symmetric expansion of the Edwards Sapien XT device and the absence of significant aortic regurgitation. Calcification or ovality of the native annulus do not influence the expansion pattern. To rigorous device oversizing however is associated with new conduction disturbances and device underexpansion.

TCT-809
Impact of New Conduction Defect After TAVI on Left Ventricular Function at 1-Year Follow-up

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Background: New left bundle branch block (LBBB) or need for permanent pacing due to LBBB block are typical after transcatheter aortic valve implantation (TAVI). In this study we evaluated the impact of new conduction defect after TAVI on the evolution of left ventricular (LV) function during one year follow-up.

Methods: A total of 90 consecutive patients treated with TAVI and 12 months echocardiographic follow-up were included in the study. In 59 patients a new conduction defect (new LBBB or need for permanent pacemaker activity) persisted one month after TAVI. In 51 patients no persistent new conduction defect was observed. 2D echocardiography using parasternal short-axis, apical 4-chamber and 2-chamber views was performed before TAVI and at 1 year follow-up to determine left ventricular volumes and ejection fraction based on Simpson’s rule. Speckle-tracking echocardiography was applied using standard LV short-axis images to assess the effect of new conduction defect on time-to-peak radial strain of different LV segments as parameter of LV dyssynchrony.

Results: New conduction defect resulted in marked heterogeneity in time-to-peak strain between the 6 analysed short-axis segments. During one year follow-up after TAVI there was a significant increase in LV EF in patients without new LBBB (53±11% vs. 60±11% at follow-up, p<0.001), while there was no change in LV EF in patients with new conduction defect (52±11% pre to 51±12% at follow-up, p=0.740). Change in LV endystolic volume was also significantly different between patient groups (t=10.1;14.2 vs. 11.2±15.7 ml, p=0.042). New conduction defect was an independent predictor of reduced LVEF at 12 months follow-up after TAVI.

Conclusions: LVEF improves after TAVI for treatment of severe aortic stenosis in patients without new conduction defect. In patients with a new conduction defect after TAVI, there is no improvement in LVEF at follow-up.

TCT-810
Assessment of Doubtful Aortic Stenosis by Measuring Simultaneous Transaortic Pressure: A Pilot Study With Fractional Flow Reserve Guidewire

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Background: Transthoracic echocardiography (TTE) is the reference technique for evaluating aortic stenosis (AS), but in certain cases, estimate of the average gradient and aortic valve area can be difficult. We aimed to assess the feasibility of measuring simultaneous transaortic pressure using a fractional flow reserve (FFR) guidewire in doubtful aortic stenosis.

Methods: Between January 2009 and December 2011, 57 patients with symptoms possibly related to severe AS that was poorly evaluated by echocardiography underwent right and left heart catheterization for assessment of aortic valve area with the Gorlin & Gorlin formula. Transaortic pressure was obtained by 2 invasive methods, namely conventional pullback method from the left ventricle (LVV) towards the aorta (PM) with subsequent computerized superposition of the pressure curves, and (2) simultaneous method using a FFR wire introduced into the LV (SM).

Results: Reasons for inaccurate assessment by echocardiography were atrial fibrillation (75%) and/or low LV ejection fraction (38%). Results of evaluation of mean aortic valve gradient and aortic valve area are summarized in the table below. Agreement between methods (using the kappa coefficient) for severe aortic stenosis defined by an aortic-valve area < 0.6 cm²/m² was 0.36 between SM and PM, 0.07 between SM and TTE, and −0.12 between PM and TTE. These findings led to a decision to change therapeutic strategy in 8 patients (14%).

Conclusions: Simultaneous measurement of trans-aortic pressure using a FFR guidewire is feasible and may be an attractive and accurate method for evaluation of doubtful aortic stenosis.