p<0.0001) and with TRV (r=0.678, p<0.0001). During a median follow-up of 16 (IQR 6–21.5 months) 12 events occurred (7 patients underwent cardiac surgery, 4 suffered heart failure events and 1 died). MCSA was predictive of worse prognosis independently of RV ejection fraction (HR 1.01 CI 95% 1.001–1.011 p 0.013). A value of 143 mm^2 held the best accuracy (sensitivity of 75% and specificity 84.4%) to predict higher rates of events.

Conclusions: MCSA is a direct measure of TR severity obtained from conventional cine sequences and predict a worse prognosis in patients with significant TR. Although our results should be confirmed in larger studies, MCSA has the potential to be incorporated in clinical practice for TR quantification.

P4213
Predictive factors for progression of mitral regurgitation in asymptomatic mitral valve prolapse patients

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Background: Current guidelines recommend mitral valve surgery for asymptomatic mitral valve prolapse (MVP) patients with severe mitral regurgitation (MR) and a left ventricular ejection fraction (LVEF) <60%. However, risk factors predicting progression in patients from low grade to severe MR eventually requiring surgical intervention remain unknown.

Purpose: We hypothesized that certain abnormalities of cardiac structure and function may predict the progression of MR severity in patients with asymptomatic mitral valve prolapse.

Methods: We followed 147 asymptomatic MVP patients (63±13 years, 44% male) with mild or moderate MR (mild=101, moderate=46), LVEF >60%, and without significant co-morbidities over a 5-year period. We examined 14 clinical variables and 16 echo measurements of cardiac structure and function. Echoes were performed in the standard manner with commercial equipment and analyzed offline on an independent workstation. Measurements were performed in accordance with American Society of Echocardiography standards. Clinical outcomes were obtained by chart review. The primary endpoint was progression to severe MR or mitral valve (MV) surgery. We also analyzed the outcome for MV surgery and heart failure (HF) in this population.

Results: In a mean follow-up of 3.0±1.9 years, all-cause mortality and the development of HF were not different between the mild and moderate MR group (P=0.762, P=0.189, respectively). No patient with mild MR progressed to severe MR, while 13 patients (28.3%) with moderate MR progressed to severe MR. Four patients who progressed from moderate to severe (30.8%) underwent mitral valve surgery. No clinical variables were shown to be predictive for MR progression. Cox proportional hazards regression analysis revealed only mean mitral annulus diameter (apical 4 and 2 chamber views) to be predictive for MR progression to severe (HR 1.15, 95% CI 1.01–1.31, P=0.034). A cut-off of 39.6 mm obtained from receiver operating characteristic was found to have a sensitivity of 100% and specificity of 71.1% (area under the curve: 0.837) for MR progression to severe.

Conclusion: Over a 5-year period, asymptomatic MVP patients who had moderate but not mild MR progressed to severe MR in 28% of cases. Only mitral annulus diameter was predictive for the progression of moderate to severe MR; an annular diameter of greater than 39.6mm was sensitive and specific in predicting this progression. Mitral annulus diameter may be of value in identifying asymptomatic MVP patients who are at risk to develop severe mitral regurgitation and require surgery in the future.

P4214
Association between atrial and ventricular remodeling assessed with cardiac magnetic resonance imaging and hemodynamic characteristics in primary mitral valve regurgitation

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Background: Cardiac magnetic resonance imaging (CMRI) is increasingly used for assessment of mitral regurgitation (MR) but few studies have assessed the association between cardiac morphology on CMRI and hemodynamic consequence of MR.

Purpose: To assess the association between cardiac morphology and function assessed with CMRI and hemodynamics at rest and during exercise in patients with significant primary MR.

Methods: Subjects with significant primary MR (N=46, 25 asymptomatic) with effective regurgitant orifice ≥0.30 cm^2 and left ventricular ejection fraction >60% by echocardiography were studied with right heart catheterization during rest and supine exercise. CMRI was done median 0 days (-2 to 6 days) of right heart catheterization. End-diastolic pressure volume relationship (EDPVR) was assessed using a single beat method based on pulmonary capillary wedge pressure (PCWP) and end-diastolic volume on CMRI.

Results: Resting PCWP was increased >12 mmHg in 8 patients (33%) with regurgitant volume <60 ml compared with 17 (77%) with regurgitant volume ≥60ml (p=0.01), and regurgitant volume correlated positively with PCWP, (r=0.42, p=0.002). However, with exercise no association between PCWP and regurgi-

tant volume was seen (r=0.09, p=0.55). Patients with increased resting PCWP had more advanced left atrial (LA) remodeling in terms of increased LA maximal (100±24 ml/m^2 vs 83±17 ml/m^2, p=0.005), minimal (56±17 ml/m^2 vs 44±15 ml/m^2, p=0.01) and LA pre atrial contraction volume index (73±16 ml/m^2 vs 61±13 ml/m^2, p=0.007). At rest LA maximal, minimal and pre A volume index correlated positively with PCWP (r=0.60, p<0.001; r=0.55, p<0.001; r=0.58, p<0.001 respectively), in contrast none of these correlated with exercise PCWP (all p>0.2). EDPVR in patients with high PCWP at rest was shifted toward higher volumes for the same pressures (Fig. 1A). The opposite was seen for patients with high PCWP (>28mmHg) during exercise as these patients had smaller estimated volumes for same pressure than patients with normal exercise PCWP (Fig. 1B).
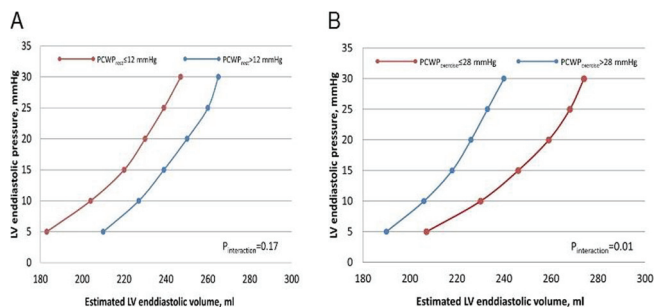

Figure 1

Conclusion: In patients with significant MR the degree of regurgitation and LA remodeling is associated with resting PCWP. However, with exercise this association disappears. Estimation of EDPVR suggests lower LV compliance in patients where PCWP is increased with exercise.

P4215
Procedural TAVI results better predict the evolution of mitral regurgitation rather than mitral valve features itself

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Background: Mitral regurgitation (MR) is a frequent concomitant condition in patients with aortic stenosis undergoing TAVI. The role of mitral valve features has been previously studied. Our aim was to analyze the impact of specific TAVI procedural results on MR evolution.

Methods: We retrospectively analyzed 436 patients who underwent TAVI in one tertiary care center; the degree of MR prior to TAVI was classified as follows: 0 absent, 1 trivial, 2 mild, 3 moderate and 4 severe MR. Follow-up with echocardiography was performed at discharge and 1-year after TAVI. Conventional echocardiography parameters were measured; besides, prosthetic maximum anteroposterior unfolding was measured in millimeters (mm). Total loss in mm and percentage loss relative to the prosthetic nominal diameter was obtained.

Results: 375 patients (86%) had any degree of MR. Moderate MR was present in 61 patients (14%) and severe MR was described in 4 patients (0.9%), the remaining had MR ≤2. Univariate analysis showed that mitral valve features had not significant role in the evolution of MR at one year; however, prosthetic effective orifice area (EOA), maximum unfolding, nominal loss, the percentage of nominal loss and LAVI were significantly associated with persistent 3 or 4 MR degree, and with an increase on MR degree. Multivariate analysis finally showed that prosthetic effective orifice area and maximum unfolding were independent statistically significant predictors of MR evolution after TAVI (Table). Area under the ROC curve of this model was 0.83 (95% CI 0.75–0.90).

	Univariate analysis		Multivariate analysis	
	OR (95% CI)	p	OR (95% CI)	p
LAVI	1.0 (0.99–1.0)	0.05	2.4 (0.61–9.4)	0.21
EOA	0.36 (0.16–0.82)	0.01	0.16 (0.03–0.75)	0.02
Maximum unfolding	0.74 (0.63–0.88)	<0.01	0.67 (0.50–0.91)	0.01
Nominal loss	1.3 (1.0–1.0)	<0.01	1.3 (0.92–1.9)	0.12
Nominal loss %	1.1 (1.0–1.2)	0.02	0.82 (0.57–1.2)	0.29
MVDD	0.88 (0.38–1.9)	0.75		
MVSD	0.80 (0.33–1.7)	0.56		
MAC	1.1 (0.43–2.8)	0.83		

LAVI: Left atrial volume index. MVDD: Mitral valve diastolic diameter. MVSD: Mitral valve systolic diameter. MAC: Mitral annulus calcification.

Conclusion: Prosthethic EOA, maximal unfolding relative to the nominal diameter of the implanted prosthesis are simple, non-invasive, non radiating parameters that predict the evolution of MR in patients with TAVI.