leaflets, and TV dysfunction caused by leads were not revealed. The TV area, AP length, and SL length were more increased compared to immediately after implantations in both worsened TR groups. However, TR was improved to mild level in 12 patients with functional TR at chronic phase after HF hospitalizations accompanied with TV reverse-remodeling. In contrast, TR levels were more worsened in patients with lead induced TR, in whom 8 patients were treated with TV repair and/or lead relocations.
Conclusions: In patients with CIEDs implantations, this study revealed two mechanisms of worsened TR i.e. functional TR and mechanical TV dysfunction caused by CIEDs leads, in which basal TV remodeling may be a common risk of TR. In contrast, since the clinical courses clearly differ between two mechanisms, the identification of TR cause by 3D echocardiography is so helpful to decide on a course of treatment.

P1589
Right atrial volume is the major determinant of tricuspid annulus area in healthy subjects and in patients with functional tricuspid regurgitation due to various etiologies

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Background: Tricuspid annulus (TA) dilation and subsequent development of functional tricuspid regurgitation (FTR) are considered to be predominantly determined by right ventricular (RV) remodeling. However, the relative impact of right atrial (RA) and RV volumes on TA size in FTR are still poorly understood.
Purpose: We sought to explore the determinants of TA area and its relationship with RV and RA volumes in normal heart and in FTR of different etiologies and severities.
Methods: We enrolled 225 patients (60±24 years, 59% women) with FTR due to various etiologies (left heart disease - LHD, pulmonary hypertension - PH, permanent atrial fibrillation - AF, and Tetralogy of Fallot with severe pulmonary regurgitation - ToF), and in 214 healthy volunteers (43±16 years, 54% women) enrolled in two academic centers from Europe and US. RV end-diastolic volume (EDV), and RA maximal volume were measured using 3D echocardiography. TA area was quantified in mid-systole with previously validated prototype 3D software. Pulmonary arterial systolic pressure (PAPS) and left ventricular (LV) volumes and function were also collected. Stepwise linear regression was used for multivariable analysis. The following univariable correlates of TA area ($p<0.05$) were included in the model: age, gender, body surface area, RV EDV, RA maximal volume, PAPS, and LV ejection fraction.
Results: In the patient groups, there were 37% pts with mild FTR, 31% with moderate and 32% with severe FTR. TA area was more closely correlated with RA volumes than with RV volumes in both healthy subjects and in patients with FTR, irrespective of etiology (Table). Multivariable analysis depicted that RA maximal volume was the most important determinant of TA area, accounting for 39% (normals) and 47% (FTR) of TA variance. Body size and gender (8% and 2% of TA variance in normals), as well as RVEDV and body size (7% and 2% of TA variance in FTR pts) were also independently correlated with TA area ($p<0.001$).

Table. Correlations of TA area

	Controls (n=214)	FTR (n=225)	LHD (n=52)	PH (n=64)	AF (n=66)	ToF (n=43)
RA maximal volume	0.62	0.72	0.76	0.50	0.74	0.70
RV EDV	0.47	0.45	0.69	0.45	0.49	0.48

Data represent Pearson R coefficients ($p<0.001$ for all).

Conclusion: RA volume emerged as the major determinant of TA size in healthy subjects and in patients with FTR, suggesting that the RA, and not RV enlargement, appears to be the main determinant of TA dilation irrespective of cardiac rhythm. These findings might have implications for patient selection and the timing of tricuspid repair procedures.

P1590
Percutaneous systemic av-valve repair for the treatment of severe tricuspid regurgitation in patients with congenitally corrected transposition of the great arteries

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Background/Introduction: Edge to edge percutaneous mitral valve repair is relatively safe and well-tolerated for high risk surgical patients with severe mitral regurgitation. Congenitally corrected transposition of the great arteries (ccTGA) with discordance at the atrioventricular and the ventriculoarterial level occurs in approximately 0.5–1% of congenital heart defects with. The systemic atrioventricular valve is prone to become progressively incompetent during the second to fifth decades of life due to dilatation and dysfunction of the morphologically right systemic ventricle.
Purpose: Because of high predicted surgical risk in these patients, we evaluated feasibility and safety of percutaneous edge-to-edge repair of severe regurgitation of the tricuspid valve (TR) in systemic av-valve position in patients with ccTGA using the Mitra Clip system (Abbott Vascular, Santa Clara, CA, USA).
Methods: All patients were rejected for surgical treatment of severe TR by the heart team. Associated anatomic abnormalities were 1 situs inversus totalis and 1 dextrocardia. The procedures were performed via venous femoral access under general anesthesia with the guidance of transesophageal echocardiography. TR classification was performed according to modified guidelines of American Society of Echocardiography and graded from +1 to +4. Transthoracic and transoesophageal examinations were performed pre-procedurally and transthoracic echocardiography was performed before discharge and after 30 days.
Results: Between 06/2016 and 01/2018 6 patients were included (46+11 years, 50% male). Percutaneous repair of the tricuspid valve in systemic av-valve position was successful in all patients. On average 2+0.5 Mitraclips were implanted with a reduction to TR<II <br follow-up. day 30 at observed was infarction myocardial or stroke embolization, MitraClip reintervention, therapy, valve surgical death, No patients. all in <II follow-up classification NYHA 83%. /> Conclusion: In patients with ccTGA and severe systemic TR and high surgical risk percutaneous edge to edge valve repair is feasible and safe and can be a valuable treatment option.

P1591
Novel transcatheter repair system for the treatment of severe tricuspid regurgitation

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Background: Transcatheter edge-to-edge repair of severe tricuspid regurgitation (TR) has been shown to be a feasible and safe treatment option for selected patients at prohibitive operative risk. Large tricuspid leaflet coaptation gaps and severe leaflet tethering represent challenging anatomic conditions that may limit the efficacy of transcatheter repair techniques. The purpose of this first-in-man experience was to investigate the procedural feasibility of the novel PASCAL transcatheter repair system (Edwards Lifesciences, Irvine, CA, USA) which incorporates a spacer and enables independent leaflet grasping to overcome some of the mentioned anatomic challenges.
Methods and results: Nine patients with severe symptomatic TR were treated with the PASCAL system in a compassionate use program at 3 sites. All patients suffered from severe right sided heart failure (NYHA III-IV) due to severe TR and were deemed inoperable by the institutional heart teams. The procedures were performed via the right femoral vein under general anesthesia using transesophageal echocardiographic guidance. Procedural success was defined as reduction of at least one TR grade. If simultaneous grasping of two tricuspid leaflets was not achievable due to a large coaptation gap and/or severe leaflet tethering, the system allowed for independent leaflet grasping – usually the anterior or posterior tricuspid leaflet first, followed by grasping of the septal leaflet.
Treated patients (age: 78±6 yrs) were considered to be at intermediate surgical risk (EuroScore II: 6±7). One procedure remained unsuccessful primarily due to difficult imaging conditions (no device placed); in the remaining 8 patients a total of 14 PASCAL devices (2 devices/patient in 6 patients; 1 device/patient in 2 patients) were placed in the tricuspid valve; 8 in the anterior-septal and 6 in the postero-septal position. A successful procedure with TR reduction by one grade was achieved in 8 patients. Applying a 5 grade scheme, the mean tricuspid regurgitation grade was reduced from 3.9±1.0 to 1.8±0.5 without relevant increase in tricuspid gradients (mean gradient 1.2±0.8 mmHg). Independent leaflet grasping was applied for 12 of 14 PASCAL devices to overcome large coaptation gaps and leaflet tethering.
During in-hospital stay, a single leaflet device attachment was observed in one patient, which was managed conservatively. No other complications were observed during or following the procedure. Of note, we did not observe pericardial effusions, TR worsening or acute worsening of right ventricular function.
Conclusions: Severe TR with large leaflet coaptation gaps can be successfully treated in selected patients with the use of the novel transcatheter PASCAL repair system, which incorporates a spacer and enables independent leaflet grasping in challenging tricuspid anatomies. A 30-day clinical follow-up will be presented.

P1592
Acute and short-term results of transcatheter treatment of severe tricuspid regurgitation using the Edge-to-Edge-repair system

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Background: Tricuspid regurgitation (TR) is associated with significant morbidity and mortality. There is a clinical need for interventional treatment strategies for patients ineligible for cardiac surgery.
Purpose: To evaluate the acute and short-term results of transcatheter edge-to-edge TR repair.