TCT-696
Predictive Value for Paravalvular Regurgitation of 3-Dimensional Anatomic Aortic Annulus Shape Assessed by Multidetector Computed Tomography post-Transcatheter Aortic Valve Replacement
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BACKGROUND Paravalvular regurgitation (PAR) remains a serious complication after transcatheter aortic valve replacement (TAVR). Multidetector computed tomography (MDCT) based measurements of the aortic basal virtual ring (BVR) are considered the gold standard for transcatheter heart valve (THV) sizing. However, the real anatomic aortic annulus is a 3-dimensional structure. Aim: To compare measurement of 3D-Anatomic Annulus with BVR and secondly to assess independent predictive parameters that may impact on PAR > mild post TAVR (PAR+).

METHODS MDCT was performed in 92 patients before and after balloon or self-expandable TAVR. 3D-AA shape was obtained point-by-point following the semilunar attachment of aortic cusps (Osirix MD 2.8.2). 3D-Oversizing index (nominal THV area/3D-AA area-1) x100 was calculated as well as 2D-Oversizing Index using BVR area instead of 3D-AA area. PAR was quantified by planimetry of vena-contracta in transthoracic echocardiography short axis view. Valvular calcium volume and annulus calcium area were measured using Hounsfield-intensity detection. ROC Curves and logistic regression for PAR+ were performed.

RESULTS BVR area overall underestimated 3D-AA area by 19.9% (p<0.001), significantly more in PAR+ (26±7%) versus PAR- (17.9%, p<0.001). 3D-Oversizing Index had greater predictive value for PAR+ (AUC=0.88) with 88% sensibility (Se) and 82% specificity (Sp) than 2D-Oversizing index (AUC=0.68) with 84% Se, but only 41% Sp (p<0.0001). Also, valvular calcium volume and annulus calcium area were less predictors for PAR+ (AUC=0.68, p<0.007). BVR area systole-diastole varies significantly which implies limitation for 2D annulus sizing. 3D-annulus showed no significant changing throughout the cardiac cycle.

CONCLUSIONS Basal ring CT measurement significantly underestimated the real 3D Anatomical Aortic Annulus area. This may impact on THV sizing and PAR incidence. 3D-Oversizing Index is the most predictive factor for PAR+.

CATEGORIES STRUCTURAL: Valvular Disease: Aortic
KEYWORDS CT sizing, Paravalvular leaks, TAVR

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TCT-697
Relationship between the degree of device oversizing and clinical outcomes in patients treated with transcatheter aortic valve replacement using balloon-expandable or self-expanding valves: Insights from the randomized CHOICE trial
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BACKGROUND A certain degree of transcatheter heart valve (THV) oversizing is considered to be important to prevent significant paravalvular leakage after transcatheter aortic valve replacement (TAVR). However, data on the degree of oversizing and its impact on clinical outcomes are limited. The objective of this analysis was to study the effect of the degree of oversizing on clinical outcomes in the CHOICE randomized trial comparing balloon-expandable (BE) and self-expanding (SE) valves.

METHODS The multicenter CHOICE trial randomized 241 high surgical risk aortic stenosis patients in a 1:1 fashion to receive either a BE (Edwards Sapien XT) or a SE (Medtronic CoreValve) THV, primary endpoint being Valve Academic Research Consortium defined rate of device success. 178 patients in this trial had 3D multidetector CT data for degree of device oversizing and were included in the present posthoc analysis. Oversizing was determined as percent oversizing ((THV perimeter/annulus perimeter-1) x100) and percent area oversizing ((THV area/annulus area-1) x100). Patients were divided into a moderate oversizing group (upto 20% area oversizing or upto 9.5% perimeter oversizing) and a large oversizing group (>20% area or 9.5% perimeter oversizing). Comparison of periprocedural and 1 year clinical outcomes for both device types were performed.

RESULTS There were 129 patients in the large oversizing group (BE, n=51; SE, n=78) and 49 in the moderate oversizing group (BE, n=39; SE, n=10). In the moderate oversizing group, device success occurred in 36/92(3.3%) of the BE patients as compared to 30/50(60%) in the SE group (p=0.005). In the large oversizing group, device success occurred in 30/56(53.6%) of the BE patients as compared to 64/92(69%) for SE group (p=0.005). More than mild aortic regurgitation (AR) by angiographic core lab assessment occurred more commonly with SE valve implantations in both oversizing groups (30% vs 7.7%, p<0.004 for moderate oversizing; 14% vs 2%, p<0.03 for large oversizing). The need for a second valve was significantly higher for SE device in the moderate oversizing group (30% vs none, p<0.007). There was no annulus rupture or major mortality in either group. Need for permanent pacemaker was higher for SE valve patients in the moderate oversizing group (55.6% vs 17.6%, p<0.03). Furthermore, no valve bilevection or more than mild AR, which occurred respectively in 50% and 12.7% of the moderate and large oversizing groups of SE THV implantations. There were no significant differences between the devices with regard to cumulative mortality, stroke rate and rates of hospitalizations at 1 year or 2 years.

CONCLUSIONS The BE TAVR group had less periprocedural and 1 year rates of AR as well as higher device success rate as compared to the SE valve group irrespective of the degree of oversizing. For SE valves, device success was higher in the large oversized group as compared to the moderate one. These findings underscore the importance of significant device oversizing with the SE valve.

CATEGORIES STRUCTURAL: Valvular Disease: Aortic
KEYWORDS Device Sizing, TAVI, TAVR

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TCT-698
Incremental Value of Computed Fractional Flow Reserve in Patients Referred to Transcatheter Aortic Valve Replacement
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CONCLUSIONS Basal ring CT measurement significantly underestimated the real 3D Anatomic Aortic Annulus area. This may impact on THV sizing and PAR incidence. 3D-Oversizing Index is the most predictive factor for PAR-.
METHODS
A total of 19 consecutive CTA exams with at least one non-invasive CTA alone as compared to invasive coronary angiography (ICA) was derived from CTA for CAD assessment in patients referred to TAVR implantation. Whether or not this incremental benefit is significant or significant to the population is still unknown. The goal of this study is to determine the diagnostic accuracy and discrimination compared to CTA alone for the diagnosis of hemodynamically significant coronary artery disease when compared to invasive FFR. However, its performance in TAVR patients is still unknown. The goal of this study is to determine the incremental benefit and to assess the diagnostic ability of FFR CT derived from CTA for CAD assessment in patients referred to TAVR over CTA alone as compared to invasive coronary angiography (ICA).

RESULTS
At patient level, out of the 19 cases, 11 (58%) were found interpretable by HeartFlow, Inc. to compute FFR CT. The major coronary artery branches were divided in 10 segments per patient, and when deemed visually interpretable and categorized in binomial fashion as non-significant or significant coronary disease using 50% cutoff value. Results were then compared to ICA results that were graded by different expert in similar fashion using more than 70% stenosis for significant disease.

Figure 1: (A) CTA showing uninterpretable LM and proximal LAD segments due to calcification blooming. (B) FFR CT of the same segments quantified from the same set of CTA images is interpretable, revealing normal values of 0.96 and 0.83, respectively. (C) ICA demonstrates normal LM and mild stenosis of the proximal portion of the LAD.

CONCLUSIONS
FFR CT analysis can enhance CTA diagnostic ability to rule out significant CAD while maintaining high sensitivity. If these findings are reproducible in large series, a significant percent of TAVR candidates would be spared from unnecessary ICA.

CATEGORIES STRUCTURAL: Valvular Disease: Aortic

KEYWORDS
Computed tomography angiography, TAVI, PCI, Aortic stenosis, CAD

TCT-700
Transcarotid Transcatheter Aortic Valve Replacement: Feasibility and Safety
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BACKGROUND
A considerable proportion of potential TAVR candidates have challenging vascular anatomies that is unsuitable for transfemoral TAVR. Transcarotid TAVR access may be an option for these patients.

METHODS
The French Transcarotid TAVR Registry is a voluntary database that has prospectively collected patient demographics, clinical and procedural characteristics, and clinical outcomes on patients undergoing transcatheter TAVR since 2009. All patients underwent pre-operative multimodal imaging assessment, including multislice computed tomography and cerebral magnetic resonance angiography. All outcomes are reported according to the updated Valve Academic Research Consortium.

RESULTS
Among 96 patients undergoing transcarotid TAVR in France at 3 sites between April 2012 and December 2013, the mean age was 79.4 (4.2%). There were no major bleeds or major vascular complications related to the carotid access site. There were 3 (3.1%) procedural deaths and 6 deaths (6.3%) at 30-days. There were 3 (3.1%) cases of VARC-defined in-hospital stroke (n = 4) or TIA (n = 2). No patient achieved the criteria for stroke and none had new ischemic lesions on neuroimaging. At 30-days, a further 3 TIAs were observed, giving an overall stroke/TIA rate of 6.3%.

CONCLUSIONS
Transcarotid vascular access for TAVR is feasible and is associated with encouraging short and medium-term clinical outcomes. Prospective studies are required to ascertain if transcarotid TAVR yields equivalent safety and efficacy to other non-femoral vascular access routes.

CATEGORIES STRUCTURAL: Valvular Disease: Aortic