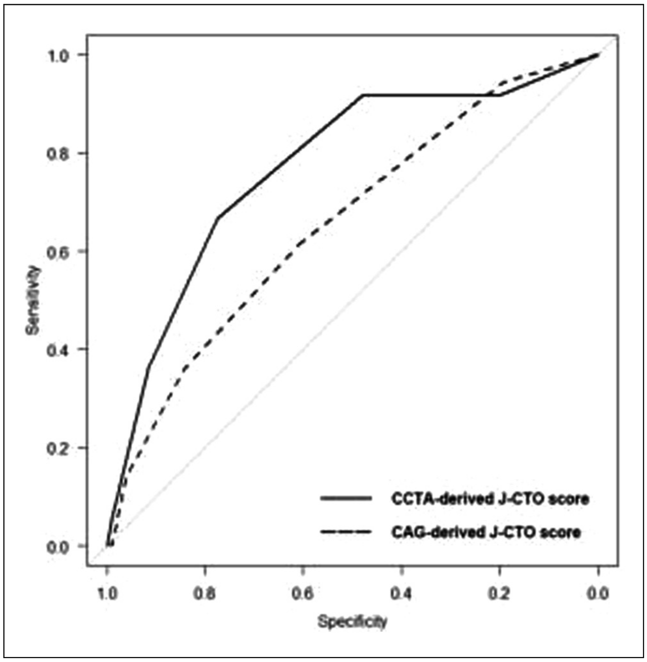
whether J-CTO score calculated by CCTA can predict successful percutaneous coronary intervention (PCI) of CTO.

METHODS We examined 214 consecutive patients who underwent CCTA before PCI of CTO in our hospital between 2012 and 2015. J-CTO score was calculated by both CCTA and conventional coronary angiography (CAG). Relationship between these two sets of J-CTO scores and procedural success of CTO-PCI was evaluated.

RESULTS CTO-PCI procedure was successful in 177 cases (83%). Retrograde approach was attempted in 57 cases (27%). Both CCTA-derived J-CTO score and CAG-derived J-CTO score are significantly associated with procedural success of CTO-PCI ($p<0.0001$, $p=0.009$, respectively). In addition, the area under the curve (AUC) of CCTA-derived J-CTO score for predicting successful CTO-PCI is significantly greater than that of CAG-derived J-CTO score (AUC=0.77 vs. 0.66, respectively; $p=0.02$).

CONCLUSIONS CCTA-derived J-CTO score may be a more useful predictor of successful PCI of CTO compared with CAG-derived J-CTO score.



CATEGORIES IMAGING: Non-Invasive

KEYWORDS Chronic total occlusion, Computed tomography angiography, Percutaneous Coronary Intervention. CTO

TCT-323

Geometric analysis of thoracic aorta and arch branches before and after TEVAR

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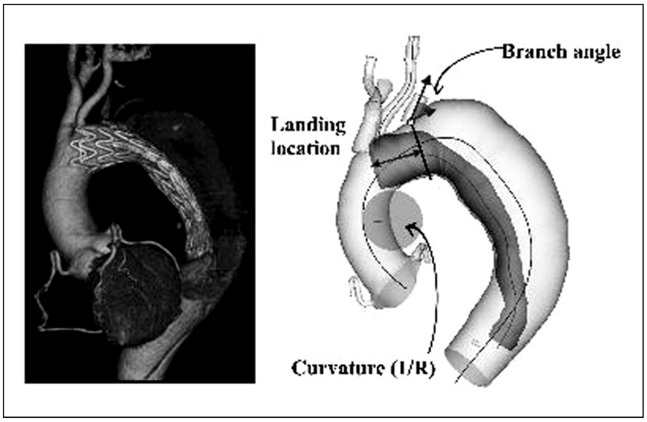
BACKGROUND Next-generation endografts for TEVAR will incorporate branched components to repair complex aortic dissections with improved fixation to the aortic arch. Design and development of these endografts benefit from understanding how current TEVAR influences the native thoracic aorta and arch branches. We apply 3D geometric modeling techniques to quantify changes of thoracic aortic and arch branch geometry following TEVAR.

METHODS 12 patients (61±5 yrs) with Type-B dissections underwent TEVAR with exclusion of the left subclavian artery (LSA). CTA images were acquired pre- and post-TEVAR, and 3D models of the thoracic aorta and arch branches were constructed to quantify geometry (Fig. 1). Landing location was defined as the relative position of the proximal end of the graft to the LSA. Branch angles were computed relative to the aortic centerline. Curvature was computed as the inverse of radius of a circumscribed circle along the aorta. Pearson's coefficient (R) was computed to quantify the correlation between geometric changes and landing location.



RESULTS The time interval between pre- and post-TEVAR was 4 ± 4 months. The landing location was proximal to the LSA by 21 ± 17 mm. Compared to pre-TEVAR geometry, the stented aorta increased peak curvature post-TEVAR ($P< 0.05$) (Table 1). While no significant pre-to-post differences were found in branch angle and mean curvature, landing location was correlated to changes in left common carotid (LCCA) angle and arch mean curvature (R= 0.78 and 0.70, respectively).

Table 1. Geometric measurements of the thoracic aorta and arch branches

	BA	LCCA	LSA	Ascending aorta	Aortic arch	Stented aorta
Branch angle (post-TEVAR, °)	63 ± 17	41 ± 17	45 ± 9	-	-	-
Δ Branch angle (°)	4 ± 12	4 ± 17b	-3 ± 12	-	-	-
Mean curvature (post-TEVAR, 10^{-3}/mm)	-	-	-	22 ± 4	17 ± 4	17 ± 2
Δ Mean curvature (10^{-3}/mm)	-	-	-	0 ± 1	-1 ± 3b	1 ± 3
Peak curvature (post-TEVAR, 10^{-3}/mm)	-	-	-	31 ± 9	23 ± 7	40 ± 5
Δ Peak curvature (10^{-3}/mm)	-	-	-	3 ± 5	0 ± 2	6 ± 7a

BA = brachiocephalic artery; LCCA = left common carotid artery; LSA = left subclavian artery; Ascending aorta = aorta from right coronary to BA; Aortic arch = aorta from BA to LSA; Stented aorta = aorta with endograft; Δ = post - pre-TEVAR. Mean curvature = average curvature over the aortic segment. Peak curvature = maximum curvature within the aortic segment.[a]significant difference between pre- and post-TEVAR ($P<0.05$). [b]significant correlation with endograft location ($R\geq0.70$).

CONCLUSIONS Peak curvature of the aorta increased with TEVAR likely due to the stiffness discontinuity introduced by the endograft. Change of arch branch geometry due to TEVAR was not significant but correlated to proximal landing location of the endograft. When the proximal end was closer to the LCCA, the LCCA branch angled toward the arch and the arch segment was straightened, compared to pre-TEVAR. Further investigation is warranted to assess in vivo motion of thoracic aorta, due to cardiac pulsatility and respiration, before and after TEVAR.

CATEGORIES OTHER: Statistics and Trial Design

KEYWORDS Graft, Modeling, Thoracic aorta

TCT-324

Elevated Echocardiographic Global Calcification Score Is Associated with Increased Mortality after Percutaneous Edge-To-Edge Repair of Mitral Regurgitation Independent of Procedural Success

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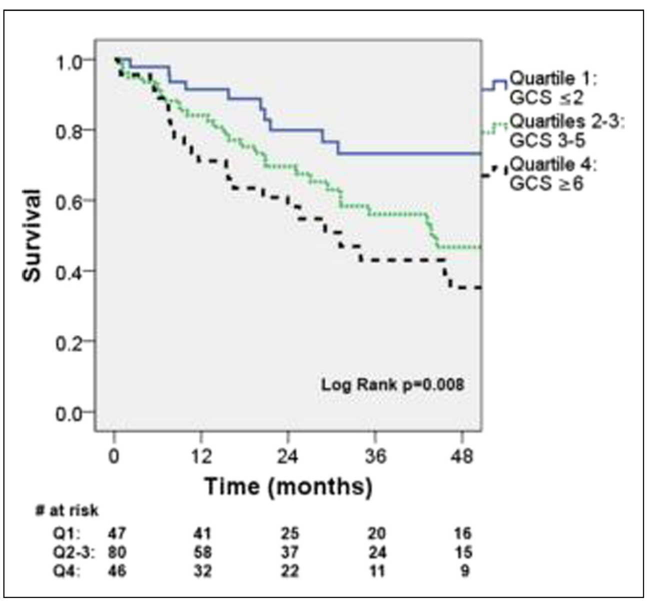
BACKGROUND An echocardiographic global calcification score (GCS) has been shown to be associated with coronary atherosclerosis and elevated mean mitral gradient (MMG). While patients (pts) undergoing percutaneous edge-to-edge repair of mitral regurgitation (MR) often have extensive calcification, the impact of calcification on survival is not known.

METHODS Pts who underwent percutaneous repair of MR with the MitraClip device (Abbott Vascular, Santa Clara, CA) between April 2009 and May 2014 were included in the analysis. Pts were grouped by the lowest quartile, middle quartiles, and highest quartile of GCS and procedural success was compared. A Kaplan-Meier curve was generated and survival compared across the groups. Univariate Cox regression analysis of GCS on the primary endpoint of all-cause mortality was performed. A multivariate Cox regression analysis simultaneously adjusting for age, history of coronary artery disease, hemodialysis status, and MMG was also performed.

RESULTS 173 pts were included in the analysis. Mean age at percutaneous repair was 76.9 ± 12.6 yrs and 40.8% were females. Coronary artery disease and hemodialysis status were present in 94/173 (54.3%) and 10/173 (5.8%) of pts, respectively. MR was moderate-to-severe in 35/173 (20.2%) of pts and severe in 138/173 (79.8%) of pts. Baseline MMG was 1.9 ± 0.9 mmHg. Median GCS was 4 (IQR 2-6). MR improved by 2 grades or more in 165/173 (95.4%) of pts after the procedure which was not significantly different between quartile 1, quartiles 2-3, and quartile 4 ($p=0.071$). MR improved to less than or equal to mild-or-moderate in 143/173 (82.7%) of pts which was not significantly different across the groups ($p=0.576$). Kaplan-Meier survival curve is shown with Log Rank $p=0.008$. In univariate and multivariate analyses, hazard ratios for mortality for each increasing point of GCS was 1.160 (95% CI 1.055 - 1.275) $p=0.002$ and 1.115 (95% CI 1.003 - 1.239) $p=0.043$, respectively. In the multivariate model, age was also associated with mortality with a hazard ratio of 1.041 (95% CI 1.013 - 1.070) $p=0.004$. History of coronary artery disease or hemodialysis status was not associated with mortality.



CONCLUSIONS Elevated GCS is associated with increased mortality after MitraClip despite simultaneously adjusting for age, history of coronary artery disease, hemodialysis status, and MMG. Further investigations are needed to better define this relationship.

CATEGORIES IMAGING: Non-Invasive

KEYWORDS Calcification, Echocardiography, Percutaneous mitral valve repair

TCT-325

Proper balloon sizing for optimal bridging aortic valvuloplasty therapy in patients awaiting Transcatheter Aortic Valve Replacement

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BACKGROUND In patients with severe aortic stenosis awaiting definitive therapy, percutaneous aortic balloon valvuloplasty(PABV) is at times necessary as bridging therapy to transcatheter aortic valve replacement(TAVR) or Surgical Aortic Valve Replacement. There are no current guidelines for proper balloon sizing in PABV intervention. Traditional balloon sizing has been based on patient's gender, aortic root angiograms and/or baseline echocardiographic data, if available. This study examined whether application of pre-procedural CT TAVR data can improve balloon sizing to optimize PABV results.

METHODS A single center retrospective review of 136 patients who underwent TAVR from July 2014-May 2015 was conducted. 56 patients required PABV as a bridge to TAVR. Of the 56 patients, 37 patients did not have pre-procedural TAVR available at time of PABV, & underwent PABV balloon sizing based on aortic annulus echocardiography/angiography (Group A). 19 patients had peri-procedural CT-TAVR data specifically aortic annulus area & mean annulus diameter available at time of PABV (Group B). Statistical analysis was performed to detect degree of improvement in echocardiographic parameters of aortic stenosis in both groups. Of the 56 patients, 50 had CT-TAVR completed prior to TAVR implantation. This patient sub-cohort was analyzed retrospectively to identify ratio of Balloon area (BA) to CT-TAVR aortic annular area (CT-TAVR AoAA) that resulted in significant improvement in Echocardiographic parameters. All patients had baseline echocardiogram performed 2 months prior to PABV and within 2 weeks post-PABV.

RESULTS There was statistically significant improvement in echocardiogram-peak gradient in Group B where CT-TAVR aortic annular area was available (Table 1). There was a trend toward improvement in mean gradient and aortic valve area(AoVA) in Group B. When CT-TAVR aortic annular area and diameters were available, operators used larger diameter balloons, which resulted in significant improvement in peak gradient in Group B. A BA to CT-TAVR AoAA ratio of >0.8 resulted in significant improvement in aortic valve gradients compared to ratio ≤0.8. The number of balloon inflations did not correlate with improvement in AoVA. Aortic regurgitation severity, when present, remained the same in pre and post PABV setting in both groups. There were no cases of aortic dissection or persistent conduction abnormalities.

Table 1. Echocardiographic outcomes of traditional balloon sizing for percutaneous aortic balloon valvuloplasty versus application of pre-procedural CT TAVR data in balloon sizing.

Average Age: 81 ± 8 years Male - 45%, Female -55%.	**All (N= 50) Mean ± Std**	**CT TAVR not available at time of PABV Group A (N= 37) Mean ± Std**	**CT TAVR available at time of PABV Group B (N= 19) Mean ± Std**	**p-value *Statistically significant**
Pre-PABV AoVA	0.7 ± 0.2	0.7 ± 0.2	0.7 ± 0.2	0.614
Peak gradient				
Absolute improvement (mm Hg)	13.8 ± 18.2	8.6 ± 16.3	23.5 ± 18.0	**0.015***
(% improvement)	(0.2 ± 0.3)	(0.1 ± 0.3)	(0.3 ± 0.2)	**(0.024*)**
Mean gradient				
Absolute Improvement (mm Hg)	7.9 ± 10.5	5.5 ± 10.0	12.3 ± 10.1	0.079
(% improvement)	(0.2 ± 0.3)	(0.1 ± 0.4)	(0.3 ± 0.2)	(0.156)
Aortic valve area (AoVA)				
Absolute Improvement (mm^2)	0.1 ± 0.3	0.1 ± 0.3	0.2 ± 0.3	0.766
(% Improvement)	(0.3 ± 0.6)	(0.3 ± 0.5)	(0.4 ± 0.7)	0.774
CT-TAVR Aortic annular Area (AoAA) (mm^2)	462 ± 94.4	454.8 ± 93.1	477.9 ± 97.8	0.418
Cross sectional area of Balloon used in BAV (mm^2)	393.6 ± 52.2	382.2 ± 41.5	415.8 ± 64.0	0.056
% balloon under-sizing compare to CT-TAVR derived aortic annular area (AoAA)	0.13 ± 0.17	0.14 ± 0.17	0.11 ± 0.18	0.743
Aortic valve parameters examined by 80% ratio cutoff of 'Balloon area:CT-TAVR aortic annular area' (BA:CT-TAVR AoAA)	**All (N= 50)**	**Balloon area/CT-TAVR AoAA >0.8 (N= 30) Mean ± Std**	**Balloon area/CT-TAVR AoAA ≤0.8 (N= 20) Mean ± Std**	**p-value *Statistically significant**
Peak gradient				
Absolute Improvement (mm Hg)	13.5 ± 18.1	18.9 ± 17.4	4.8 ± 16.1	**0.027***
(% improvement)	(0.2 ± 0.3)	(0.3 ± 0.2)	(0.0 ± 0.4)	**(0.016*)**
Mean gradient				
Absolute improvement (mm Hg)	8.0 ± 10.2	10.8 ± 9.9	3.3 ± 9.1	**0.020***
(% improvement)	(0.2 ± 0.3)	(0.3 ± 0.2)	(0.0 ± 0.4)	**(0.023*)**
Aortic valve area (AoVA)				
Absolute improvement (mm^2)	0.2 ± 0.3	0.2 ± 0.3	0.1 ± 0.3	0.064
(% improvement)	(0.4 ± 0.6)	(0.5 ± 0.6)	(0.2 ± 0.5)	(0.166)