TAVR - Imaging

Moscone West, 2nd Floor, Room 2009

Tuesday, October 29, 2013, 1:00 PM–3:15 PM

Abstract nos: 104-111

ORALS

TCT-104

Impact of Aortic Root Calcification Volume on Clinical Outcomes After Transcatheter Aortic Valve Implantation

Yusuke Watanabe[1], Bertrand Cormier[2], Kentaro Hayashida[1], Thierry Lefevre[1], Erik Bouvier[1], Bernard Chevalier[1], Mauro Romano[1], Thomas Hovasse[1], Philippe Garot[3], Patrick Donzeau-Gouge[1], Arnaud Farge[1], Marie-Claude Morice[1]
[1]Institut Cardiovasculaire Paris Sud, Générale de Santé, Massy, France, [2]Hôpital Privé Jacques Cartier, Massy, France, [3]Institut Cardiovasculaire Paris Sud, Générale de Santé, Quincy, France

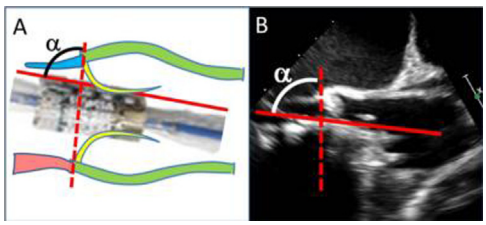
Background: Little data is available about whether aortic root calcification may impact the outcomes after TAVI. This study sought to evaluate the impact of aortic root calcification volume on clinical outcome after transcatheter aortic valve implantation (TAVI).
Methods: The term 'aortic root' refers to the aortic valve from its insertion at the left ventricular outlet to the sino-tubular junction. Multidetector row computed tomography (MDCT) has been shown to be a very simple and reliable tool to quantify the amount of calcifications.
Results: A total of 222 TAVI patients (aged 83.4±7.1 years, Logistic EuroSCORE 19.4±11.8) with preprocedural MDCT were studied. The Edwards valve was used in 162 (73.0%) patients and the CoreValve in 60. Aortic root calcification volume was measured using MDCT and a Valve Calcification Index (VCI) was defined as calcification volume (mm3)/ aortic annulus area (mm2). VCI (hazard ratio [HR] 2.10, 95% confidence interval [CI] 1.34 to 3.26, p<0.01) and baseline ejection fraction (HR 0.96, 95% CI 0.93 to 0.99, p=0.02) were identified by multivariate analysis as the only independent predictors of 30-day mortality after Edwards valve implantation. A VCI threshold of 2.05 (area under the curve 0.71, p<0.01) predicted a higher incidence of annulus rupture (10.5 vs 0.9%, p=0.01) and cardiac tamponade (14.6 vs 1.9%, p<0.01), lower device success (80.0 vs 98.2%, p<0.01) and 30-day survival rate (79.2 vs 95.4%, p<0.01) after Edwards valve implantation. Clinical outcomes after CoreValve implantation were not influenced by the VCI.
Conclusions: Valve calcification as assessed my MDCT using aortic root calcification volume indexed by annulus size (VCI) is a predictor of worse outcome after Edwards valve implantation, mainly related to annulus rupture. This VCI does not influence clinical outcomes after CoreValve implantation. Application of VCI may help improve valve selection.

TCT-105

Device-to-Annulus Pre-deployment Angle by Intraoperative Transesophageal Echocardiography Predicts Paravalvular Regurgitation following Transcatheter Aortic Valve Replacement

Leo Marcoff[3], Omar K. Khalique[1], Susheel Kodali[1], Mathew Williams[1], Tamim Nazif[1], Jean-Michel Paradis[1], Isaac George[1], Martin Leon[2], Rebecca Hahn[1]
[1]Columbia University, New York, NY, [2]Cardiovascular Research Foundation, New York, NY

Background: Pre-deployment position of the transcatheter valve (THV) may affect the valve position and procedural outcomes.
Methods: Intraoperative TEE from 100 patients presenting for TAVR were retrospectively analyzed for pre-deployment (rapid pacing) device-to-annulus angle (DTA) defined as the angle between the posterior device border and plane of the annulus (Figure 1). Patients with unreliable pacemaker capture or obvious operator-induced device motion during deployment were excluded (n=16).
Results: Eighty four patients were analyzed. The mean pre-deployment DTA was 78.9±8.3° (range: 60.7-96.1°). DTA was smaller with transfemoral access (n=72, DTA = 77.3±7.7) compared to transapical (n=8, DTA = 88.6±4.0°, p=0.0001) or transaortic (n=4, DTA = 88.03±4.7°, p=0.0075). DTA was significantly smaller with SAPIEN (n=53) vs SAPIEN XT (n=31) (77.3±8.6° vs. 81.6±6.9°, p=0.020). DTA was associated with greater operator-independent cranial movement of the device midpoint during deployment (3.2±1.8 mm for DTA≤75° vs. 2.0±1.4 mm for DTA>75°, p=0.0015). DTA was smaller in cases where post-dilatation was performed (n=26) (75.4±8.3° vs. 80.4±7.8°, p=0.0082). In ROC analyses DTA<75.1° was a significant predictor of post-procedural ≥2+ paravalvular regurgitation (n=28) (sensitivity 57%, specificity 75%, AUC=0.67, p=0.0092).
Conclusions: Smaller DTA is seen with transfemoral access and SAPIEN version THV. DTA angle of ≤75° is associated with greater operator-independent cranial movement of the device during deployment and is predictive of ≥2+ post-procedural paravalvular regurgitation.



TCT-106

Novel Hemodynamic Index for the Assessment of Aortic Regurgitation After Transcatheter Aortic Valve Replacement

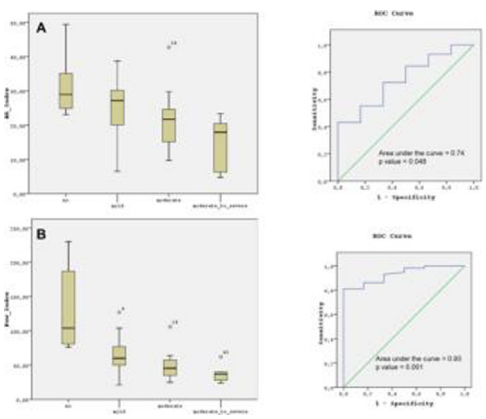
Baris Bugan[1], Samir Kapadia[2], Lars Svensson[3], Amar Krishnaswamy[4], E. Murat Tuzcu[5]
[1]Cleveland Clinic, Cleveland, Ohio, United States, [2]Cleveland CLinic, Cleveland, United States, [3]Cleveland Clinic, Cleveland, USA, [4]Cleveland Clinic, Cleveland, OH, [5]Cleveland Clinic Foundation, Cleveland, Ohio

Background: Paravalvular aortic regurgitation (AR) after transcatheter aortic valve replacement(TAVR) has been associated with increased mortality. The aim of this study is to examine the previously described AR index and determine whether any modification to this index can improve its performance.
Methods: The study included 64 patients treated with the Sapien valve (Edwards Life Sciences, Inc., Irvine, CA). The severity of AR was evaluated using echocardiography, angiography, and invasive hemodynamic parameters. We evaluated time integrated aortic regurgitation (TIAR) index as follows: (LV-Ao diastolic pressure time integral) / (LV systolic pressure time integral)x100. We analyzed AR index and TIAR index with receiver operating characteristic (ROC) curve.
Results: AR was observed in 58 patients (90.7%) and graded as mild in 33 (51.6%), moderate in 20 (31.3%) or moderate-to-severe in 5 (7.8%) cases. AR index and TIAR index decreased proportionate to increase severity of AR (p=0.002, p<0.001, respectively)(Table 1). TIAR index > 80 was associated with sensitivity of 86% and specivicity of 83% for ≥ mild AR. Area under curve was greater for TIAR index compare to AR index (0.93 versus 0.74) (Figure 1).

Table 1. AR Index and TIAR Index According to the Degree of AR

	All patients (N=64)	No AR (n=6)	Mild AR (n=33)	Moderate AR (n=20)	Moderate to Severe AR (n=5)	p value
AR Index	23.5±8.9	31.7±9.6	25.2±7.8	20.7±7.9	14.6±8.5	0.002
TIAR Index	62.8±35.6	130.3±63.4	63.2±23.7	48.1±17.8	38.2±14.8	<0.001

AR; Aortic Regurgitation, TIAR; Time Integrated Aortic Regurgitation.



Conclusions: The TIAR index provides a useful hemodynamic measure for assessing severity of AR which is better than AR index.