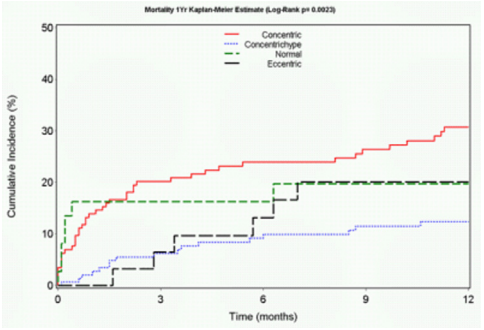

TCT-741

Comparison of long-term clinical outcome between patients with chronic versus acute type B aortic dissection treated by implantation of a stent graft: a single-center report

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Background: Background: Stent grafting for treatment of type B aortic dissection has been extensively used. However, the difference in the long-term clinical outcome between patients with chronic versus acute type B aortic dissection remains unknown. This study aimed to analyze the difference in long-term clinical outcome after endovascular repair for patients with chronic ($2 weeks) versus acute (<2 weeks) type B aortic dissection.
Methods: Between May 2000 and June 2011, a total of 174 patients with type B aortic dissection (56 chronic, 118 acute) treated by endovascular repair were studied prospectively. Follow-up three-dimensional computed tomography scanning and aortoangiography were scheduled at 3–6 months after the index procedure. Propensity score matching was used to compare the difference in the endpoint between the two groups.
Results: The procedure-related event rate was 18.6% in the acute group and 5.4% in the chronic group (P = 0.021), but this difference became nonsignificant after propensity score matching. At the end of follow-up (mean 2.49 years), overall and aorta-related mortality was 11.0% and 7.6%, respectively, in the acute group, and was not significantly different from that in the chronic group (3.6% and 3.6%, P = 0.148 and P = 0.506, respectively). Both false and true lumina showed significant remodeling over time, with .93% complete false-lumen thrombosis. Untreated tear and type I endoleak were predictors of clinical events during follow-up.
Conclusions: Comparable long-term clinical results were achieved in patients with chronic or acute type B aortic dissection after implantation of a stent graft.

TCT-742

Lower Vascular Complications With Percutaneous versus Open Transfemoral Transcatheter Aortic Valve Replacement

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Background: Transcatheter aortic valve replacement (TAVR) via the transfemoral (TF) approach is currently performed by both open surgical and percutaneous access. Vascular complications are associated with morbidity and mortality, but few studies have directly compared access approach.
Methods: Data was collected on all patients undergoing TF TAVR with Sapien or Sapien XT aortic bioprostheses (Edwards Inc., Irvine, CA) between November 2007 and April 2013 at our institution. Valve Academic Research Consortium definitions were utilized.
Results: TF TAVR was performed in 331 patients via an open surgical (n=120) or percutaneous (n=211) approach. Both groups were similar in age, however the open group had a greater incidence of cardiovascular comorbidities. The average sheath outer diameter (OD) was slightly larger in the open group as compared to the percutaneous group (8.6 ± 0.4 vs. 8.4 ± 0.6 mm, p<0.001). There were fewer major vascular complications in the percutaneous as compared to the open group (11% vs. 20%, p=0.03), and a trend toward fewer overall vascular complications (17% vs. 26%, p=0.06). More patients with vascular complications in the percutaneous cohort had minimal artery diameter (MAD) less than sheath OD (74% versus 55%, p=0.03). The percutaneous group had decreased length of stay (LOS) compared to the open group (7.5 ± 4.7 vs. 9.9 ± 9.9 days, p=0.003). There was no difference in in-hospital mortality between the open and percutaneous groups (2.5 % vs. 1 %, p=0.36). The use of second generation TAVR sheaths and valves via a percutaneous approach was associated with an even greater reduction in vascular complications (8% vs. 25%, p=0.01) and LOS (7.0 ± 4.8 versus 10.1 ± 10.0 days, p=0.04) as compared to the open group with first generation devices. Despite an increase in the difference between sheath OD and MAD (-0.21 vs. 0.27 mm, p=0.02) in the first and second half of our percutaneous access experience, the rates of vascular complications did not change over this time.
Conclusions: TF TAVR via a percutaneous approach is associated with less vascular morbidity and lower LOS as compared to an open surgical approach. These benefits are even greater with second-generation (Sapien XT) devices.

TCT-743

Stratification of survival after transcatheter aortic valve replacement based on vascular complication by VARC-1 or VARC-2 criteria

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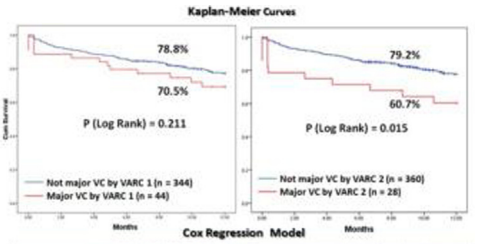
Background: Valve academic research consortium (VARC) guidelines were devised in an effort not only to standardize clinical endpoint definitions but also to select endpoints that best reflect the safety and efficacy of transcatheter aortic valve replacement (TAVR). These guidelines are evolving in an expert led manner. We sought to compare the predictive value for survival of major vascular complications (VC) by VARC-1 and 2 definitions.
Methods: A large single center series of patients undergoing TAVR by multiple approaches were studied. We defined VC according to VARC-1 and VARC-2 definition, and compared the mortality one year after the procedure. Data was analyzed using Kaplan-Meier (KM) and Cox regression multivariable models that included all variables related to 1-year mortality to a significance level≤0.1.
Results: Data was analyzed for 388 patients. KM curves showed a numerically lower survival rate at 1-year by major VC with both definitions, but only VARC-2 had statistical significance; 79.2% vs. 60.7% with VARC-2 (p =0.015), and 78.8% vs. 70.5% with VARC-1 (p = 0.211). Cox regression multivariable model showed VC by VARC-2 definition to be an independent predictor of 1-year mortality (p = 0.004), but not when VC was substituted by the VARC-1 definition (p=0.08).
Conclusions: The VARC-2 definition for vascular complications offers better stratification of survival than the VARC-1 definition, supporting its widespread use. Reasons for this important difference will be discussed.



Cox Regression Model

	Sig.	HR	95.0% CI for HR Lower	Upper
Age	.040	.971	.945	.999
Female	.002	.400	.222	.722
Baseline Creatinine > 2	.026	1.878	1.079	3.267
Pulmonary Disease	.002	2.310	1.345	3.966
Baseline Brain Natriuretic Peptide	.003	1.000	1.000	1.001
Baseline Left Ventricular Ejection Fraction	.263	.991	.976	1.007
Baseline Peak Aortic Valve Velocity	.239	.807	.565	1.153
Major VC by VARC 1	.080	1.874	.928	3.786

	Sig.	HR	95.0% CI for HR Lower	Upper
Age	.079	.975	.948	1.003
Female	.001	.382	.212	.690
Baseline Creatinine > 2	.008	2.153	1.223	3.791
Pulmonary Disease	.002	2.350	1.363	4.053
Baseline Brain Natriuretic Peptide	.009	1.000	1.000	1.001
Baseline Left Ventricular Ejection Fraction	.185	.990	.974	1.005
Baseline Peak Aortic Valve Velocity	.162	.790	.567	1.099
Major VC by VARC 2	.004	3.079	1.447	6.551

TCT-744

Quantitative Assessment of Balloon-Expandable Valve Position During Transcatheter Aortic Valve Replacement Using Intraoperative Transesophageal Echocardiography

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Background: Although prior studies describe the fluoroscopic operator-independent motion of the balloon-expandable valve, no studies have described the transesophageal echocardiogram (TEE) appearance of valve deployment.
Methods: Intraoperative TEE from 100 consecutive* patients presenting for TAVR were retrospectively analyzed. Patients with unreliable pacemaker capture or obvious operator-induced device motion during deployment were excluded (n=16). Device position was defined as the percent of total device height below the virtual annulus (hinge points of aortic valve cusps). Device position was measured pre-deployment (during rapid pacing) and post-deployment. Device cranial movement during deployment was defined as the difference between the pre-deployment and post-deployment position (in mm) of the valve midpoint.

Results: Eighty four patients were included in the final analysis. Device position post-deployment was significantly higher than pre-deployment (16.1±12.5% vs. 33.7±12.5%, p<0.0001). Operator-independent cranial movement during deployment was 2.4±1.6 mm (range -0.35 to 6.8 mm). There was foreshortening of the device during deployment with lower edge of the valve moving farther cranially than the upper edge (3.6±1.7 vs. 1.3±1.6 mm, p <0.0001). This movement was similar between valve versions and vascular access. There was a trend (p = 0.09) for more movement with the 29 mm valve. Valve movement was not significantly related to echo parameters listed in Table 1.
Conclusions: Operator-independent cranial movement of the balloon-expandable transcatheter valve occurs during its deployment. There is device foreshortening with deployment explained by the fact that caudal edge of the device moves farther than the cranial edge. This deployment movement of the device can be characterized by TEE and may help with positioning immediately prior to valve deployment.

Table 1. Transcatheter aortic valve movement during valve deployment

	Device Movement (midline), (mm)	p
Valve Type		
SAPIEN (n = 53)	2.39±1.64	0.686
SAPIEN XT (n = 31)	2.54±1.65	
Valve Size (mm)		
23 (n = 25)	2.17±1.83	0.53 (23 vs.26) 0.077 (23 vs.29) 0.095 (26 vs.29)
26 (n = 51)	2.43±1.58	
29 (n = 8)	3.41±1.02	
Access		
Transfemoral (TF), (n = 72)	2.45±1.65	0.87 (TF vs. TA) 0.84 (TF vs. Tao) 0.80 (TA vs. Tao)
Transapical (TA), (n = 8)	2.34±1.65	
Transaortic (Tao), (n = 4)	2.61±1.72	
AV Area (cm^2)		
<0.67 (n = 41)	2.47±1.79	0.89
≥0.67 (n = 43)	2.42±1.50	
Aortic Annulus Diameter (mm)		
<23 (n = 38)	2.37±1.77	0.72
≥23 (n = 46)	2.50±1.53	
Interventricular septal thickness (mm)		
>1.3 (n = 53)	2.38 ±1.57	0.65
≥1.3 (n = 31)	2.55 ±1.76	
Valve Calcification by TEE		
no/mild (n = 39)	2.41±1.54	0.85
moderate/severe (n = 45)	2.47±1.73	
Sinus Volume (cm^3) by TEE		
<7.6 (n = 42)	2.37±1.70	0.68
≥7.6 (n = 42)	2.52±1.58	

*consecutive patients who had cardiac CT angiography as part of preoperative evaluation.

TCT-745

CoreValve Oversizing Using Multislice Computed Tomography and Clinical Outcomes: A Comparison with Transesophageal Echocardiography

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Background: Accurate measurement of the aortic annulus and adherence to oversizing principles are crucial for transcatheter aortic valve replacement (TAVR). We sought to assess adherence to transcatheter heart valve (THV) oversizing principles according to transesophageal echocardiography (TEE) and computed tomography (CT) and to evaluate the relationship between the adherence to oversizing and clinical outcome.
Methods: Between 2009 and 2010, 157 aortic stenosis patients underwent screening CT prior to CoreValve implantation. During this early experience, CT was performed only to evaluate the peripheral vasculature. In all cases, TAVR-sizing was performed using TEE. CT datasets were retrospectively reconstructed and the CTmean, CTarea, and CTperimeter dimensions were measured. TEE and CT diameters were used to determine oversizing. Significant paravalvular leak (PVL) (≥grade 2) was the primary clinical outcome measure.
Results: TEE-derived diameters were significantly smaller than CT-based measurements (p<0.0001). According to TEE and CTperimeter, 95.5% and 78.3% were suitable for CoreValve implantation (26/29mm), respectively. Using TEE, 80.9% received the appropriate valve size, while CTperimeter suggested that only 51.0% met oversizing criteria. The average oversizing with TEE 20.2±8.3% compared to 10.1±8.6% with CTperimeter. After CoreValve implantation, 38 (24.2%) patients had significant PVL. PVL was similar among patients that satisfied and those that did not satisfy sizing criteria using TEE (23.6%vs26.7%,p=0.813). When CT data was applied, PVL was significantly lower in those that satisfied sizing criteria (CTperimeter: 13.8%vs35.1%,p=0.0026). Adherence to CT but not TEE-sizing, was associated with a reduction in PVL (CTperimeter:odds ratio:0.30;95% CI:0.13-0.65,p=0.002). Sensitivity-specificity curves for CTperimeter identified minimal oversizing thresholds of 9.0% and 9.6% for the 26 and 29mm CoreValves that best predicted PVL.
Conclusions: Compared to TEE, CT-based THV-sizing yields larger annular diameters, changes the selected valve size in half of all patients, and is predictive of PVL. CTperimeter is the most sensitive CT measurement for predicting PVL.

TCT-746

Cerebral Ischemic Lesions after Percutaneous Transfemoral Aortic Valve Implantation: Comparison between Edwards Sapien XT versus Direct Flow Medical Valve Prosthesis

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Background: Objectives: To compare the cerebral embolic load, assessed by diffusion weighted magnetic resonance imaging (DW-MRI), after percutaneous implantation of Edwards Sapien XT (SXT) versus Direct Flow Medical aortic valve (DFM) implantation. Background: New cerebral ischemic lesions after percutaneous implantation of commercially available aortic valves are found in more than 80% of patients. The DFM is a non-metallic prosthesis, which is placed pulling it through the left ventricular outflow tract up to the aortic annulus, jailing the native valve behind a polymer cuff. It is unknown whether this impacts the risk of cerebral embolization.
Methods: We performed a DW-MRI the day before and 48 to 72 h after TAVI. DW-MRI studies were blindly analyzed by a radiologist, and all patients had a neurological assessment before and after the procedure.
Results: In 36 consecutive patients (mean age 82.8 ± 4.9 years, 56 % male) with severe symptomatic aortic stenosis and high surgical risk were studied. In a SXT (16 pts), a DFM (20 pts) was successfully implanted via the femoral artery. There was no difference in patient demographics as well as in the log EuroScore and in comorbidities between both groups. All pts underwent a balloon valvuloplasty before and 1 pt with SXT also after valve implantation. None of the pts had a stroke or TIA. The incidence of new cerebral ischemic lesions did not differ significantly in with DFM compared to SXT pts. (17/20, 85%, versus 10/16, 62.5%, p=0.12). However, new ischemic lesions were more frequently found in both hemispheres in DFM compared to SXT patients (55% vs. 18.8%, p=0.03). The number of ischemic lesions per patient was significantly higher in DFM patients (3.3 ±2.6 for DFM vs 1.7 ± 2.5 for SXT, p=0.049). For the volume of lesions there was a trend in favour of SXT (0.17 ml± 0.3 cm3 vs.0.34 ml ± 0.56cm3, p=0.2).
Conclusions: The type of valve prosthesis for percutaneous treatment of severe aortic stenosis may have an impact on cerebral embolization.

TCT-747

Transcatheter Aortic Valve Replacement: Assessment of the Learning Curve Based on the PARTNER Trial

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Background: Transcatheter aortic-valve replacement (TAVR) is a new procedure for the treatment of severe aortic stenosis. The number of cases require to gain proficiency "learning curve" is unknown. The aim of this study is to assess the learning curve of the team involved in the performance of TAVR in the PARTNER trial. We hypothesized that a) a quantifiable learning curve exists for TAVR and b) process measures of procedural proficiency would improve with increasing case volumes