TCT-723
Should What The Default Vascular Access And Closure Strategy Be For Transcatheter Aortic Valve Replacement?
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Background: Transcatheter aortic valve replacement (TAVR) success is hampered by a relatively high rate of vascular complications, which correlates with mortality. A trend from surgical access to percutaneous has led to a decrease in the reported complication rate, but it is still considered a valid access strategy. The aim of this study was to explore the vascular complication rates of surgical versus percutaneous access for TAVR and of the two most frequently used closure devices.

Methods: From a cohort of 231 patients who underwent transmemoral TAVR, 38 (16.5%) had planned surgical access while 193 (83.5%) had percutaneous (Perclose ProGlide n=160; ProStar n=33). A comparison of the three groups’ baseline characteristics, Valve Academic Research Consortium (VARC)-defined vascular complication, and mortality rates was performed.

Results: Baseline characteristics were mostly similar save for a higher incidence of SAPIEN valve use in the surgical access group (71.3% percutaneous vs. 97.4% surgical; p < 0.001). Although the rate of major VARC vascular complication did not differ between groups, (Figure) access site hematoma, major bleeding and need for transfusion were more frequent in the surgical access group. Mortality rates at 30 days and 1 year did not differ among the three groups. No differences were noted in outcome when Perclose was compared with Prostar use.

Conclusions: Complete percutaneous vascular access and closure with either Perclose ProGlide or ProStar is associated with lower rates of vascular complications compared with surgical cut down and should be the preferred access technique in TAVR.

TCT-724
Low-Flow Low-Gradient Severe Aortic Stenosis by Echocardiography Does Not Reliably Predict Aortic Stenosis Classification by Invasive Hemodynamics
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Background: It may be challenging to distinguish low-flow low-gradient (LFLG) severe aortic stenosis (AS) from pseudo-severe AS, underestimation normal-flow high-gradient (NHFG) AS, or inaccurate effective orifice area (EOA) on transhepatic echocardiography (TTE). We evaluated changes in classification of AS by left/right heart catheterization (LHC) over TTE findings alone.

Methods: We examined 144 consecutive individuals with severe AS on TTE (EOA <1.0 cm2 or indexed EOA <0.6 cm2/m2) and LHC within 2 months referred for possible transcatheter aortic valve implantation (TAVI), and after exclusion of patients with >mild tricuspid regurgitation (n=27), subaortic obstruction (n=3) or non-diagnostic studies (n=6). We evaluated the prevalence and hemodynamic tics of NHFG (mean gradient >40 mmHg or peak velocity >4.0 m/sec) and LFLG severe AS on TTE (mean gradient ≤40 mmHg and peak velocity ≤4.0 m/sec), and assessed the frequency in which LHC reclassified AS type.

Results: Mean age was 78±9.8±8.8 years, and 58.3% were male. TTE observed a high mean gradient in 36% (52/144) of patients, while a high peak velocity was noted in 44% (63/144). LHC observed a high gradient in 59% (85/144) of individuals. Overall, TTE identified NHFG and potential LFLG severe AS in 46% (66/144) and 54% (78/144) of patients, respectively. In the 78 patients with potential LFLG severe AS by TTE, LHC reported a mean gradient >40 mmHg in 41% (32/78), consistent with TTE underestimation of gradients; in an additional 10% (8/78), LHC reported an EOA >1.0 cm2, suggesting overestimation of AS severity on TTE. In comparison to TTE alone, the addition of LHC findings reduced the proportion of patients with potential LFLG severe AS from 54% (78/144) to 26% (38/144) (p<0.001), while LHC confirmed the presence of severe AS in 94% (136/144) of patients.

Conclusions: TTE reporting of LFLG severe AS is common in patients referred for TAVI. The addition of LHC hemodynamics reclassified about half of LFLG cases by TTE as having NHFG severe AS, although LHC agreed with the overall diagnosis of severe AS in 94% of cases. In patients with LFLG severe AS by TTE, LHC may be useful to confirm this diagnosis.

TCT-725
Aortic Valve Calcium Score (AVCS) Predicts The Prevalence Of Paravalvular Leakage After Transcatheter Aortic Valve Implantation (TAVI)
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Background: TAVI represents an emerging technology that is nowadays widely used for the treatment of aortic-valve disease in high-risk patients. However, paravalvular leakage (PVL) still represents one of the most important problems related to TAVI, related to the association with increased mortality and morbidity. This study evaluates the impact of CT based aortic valve calcification and its distribution on the post-procedural occurrence of PVL.

Methods: From May 2008 to December 2012 a total of 369 patients were scheduled for the treatment of aortic stenosis with a TAVI procedure either using a CoreValve-Medtronic (N=198), Edwards-SAPIEN (n=161) or Edwards-SAPIEN 3 (n=20). A Medtronic-Engager prosthesis (n=5). Of these, 260 patients with a mean logistic EuroSCORE I of 19.3±12% had a preoperative CT-scan and were included in this study. AVCS was measured in mg and mm³ using a method analogous to the Agatston calcium scoring of coronary arteries. The image data were analyzed separately to determine the degree of calcification for each cusps and commissures. The occurrence of intra- or post-procedural PVL was assessed by echocardiography and correlated to the calcium degree and distribution.

Conclusions: This study highlights the significant correlation between the degree of calcification and the occurrence of post-interventional paravalvular leakage after TAVI procedure. Thus, preoperative AVCS calculation may represent an important predictor for PVL and may be added to the routine list of parameters for CT planning before TAVI. *PVL Grade 0 – none; 1 – minimal; 2 – mild; 3 – moderate

TCT-726
Characteristics and outcomes of clopidogrel responder and hypo-responder patients post transcatheter aortic valve replacement
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Background: Dual anti-platelet therapy is an essential component of post- percutaneous coronary intervention (PCI) and transcatheter aortic valve replacement (TAVR) management. While several trials have studied the impact of hypo-responsiveness to clopidogrel [Platelet Reactivity Units (PRU) > 230] in PCI patients, data on the clopidogrel hypo-responsiveness post TAVR is lacking. The objectives of the study were to characterize responders and outcomes of clopidogrel responders and hypo-responders using Accumetrics VerifyNow® (San Diego, CA) P2Y12 testing post TAVR.

Methods: Twenty two consecutive patients underwent TAVR and platelet function testing after initial background aspirin and 600 mg of clopidogrel. Post procedure a daily maintenance dose of 75 mg clopidogrel was administrated. Patients' characteristics, presentation [heart failure, syncope, angina] and major adverse cardiac events (MACE) (death, acute myocardial infarction, major bleeding and re-admission) were compared between responders and hypo-responders.

Results: Of the 22 patients 15 (68%) were hypo-responders. Comparison between the two groups is presented in table 1. MACE rate at 30 days was similar between responders and hypo-responders [27 (29%) vs. 3/15 (20%), respectively, p = 0.9].
Table 1. Comparison of patients characteristics between both groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Hypo-responders</th>
<th>Responders</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>84.1±1.7</td>
<td>76.8±1.7</td>
<td>0.08</td>
</tr>
<tr>
<td>Gender (Men)</td>
<td>11 (73%)</td>
<td>2 (29%)</td>
<td>0.07</td>
</tr>
<tr>
<td>Body Mass Index</td>
<td>30.1±6.9</td>
<td>24.2±5.4</td>
<td>0.01</td>
</tr>
<tr>
<td>HTN</td>
<td>15 (100%)</td>
<td>7 (100%)</td>
<td>1</td>
</tr>
<tr>
<td>DM</td>
<td>8 (40%)</td>
<td>6 (86%)</td>
<td>0.19</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>14 (93%)</td>
<td>3 (43%)</td>
<td>0.02</td>
</tr>
<tr>
<td>Prior Smoker</td>
<td>8 (53%)</td>
<td>3 (43%)</td>
<td>0.09</td>
</tr>
<tr>
<td>Prior MI</td>
<td>4 (27%)</td>
<td>2 (29%)</td>
<td>1</td>
</tr>
<tr>
<td>Admission with CHF</td>
<td>14 (93%)</td>
<td>6 (86%)</td>
<td>0.9</td>
</tr>
<tr>
<td>Troponin (ng/ml)</td>
<td>3.68±3.13</td>
<td>0.05±0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Cholesterol (mg/dl)</td>
<td>117.7±15.7</td>
<td>88.5±14.8</td>
<td>0.03</td>
</tr>
<tr>
<td>Hg (g/dl)</td>
<td>9.87±1.4</td>
<td>9.57±1.6</td>
<td>0.3</td>
</tr>
<tr>
<td>PLT (K/u)</td>
<td>159±43.9</td>
<td>172±68.9</td>
<td>0.3</td>
</tr>
<tr>
<td>Creatinine (mg/dl)</td>
<td>1.75±1.9</td>
<td>1.73±1.6</td>
<td>0.5</td>
</tr>
</tbody>
</table>

HTN: Hypertension; DM: Diabetes Mellitus; MI: Myocardial infarction; CHF: Congestive heart failure; CK: Creatine kinase; Hg: hemoglobin; PLT: platelets.

Conclusions: Clopidogrel hypo-responsiveness post TAVR is a very common phenomenon. These patients are characterized by higher BMI, dyslipidemia and a trend towards older age and male gender. MACE rate at 30 days was similar for responders and hypo-responders. Further studies are needed to investigate this high rate of hypo-responsiveness post TAVR and its potential consequences on clinical outcomes.

TCT-727

Impact Of Coronary Artery Disease Severity Assessed by SYNTAX-Score On Clinical Outcomes in Patients Undergoing Transcatheter Aortic Valve Implantation

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Background: Coronary artery disease (CAD) and aortic stenosis (AS) frequently coexist. It remains unknown whether CAD severity exerts a gradient of risk in patients with AS undergoing transcatheter aortic valve implantation (TAVI).

Methods: A total of 445 patients with severe AS undergoing TAVI were included into a prospective registry between 2007 and 2012. The preoperative SYNTAX-score (SS) was determined from baseline coronary angiograms. In case of revascularization prior to TAVI, residual SS (SSR) was also determined. Clinical outcomes were compared between patients without CAD (N=158), patients with low SS (0-22; N=207), and patients with high SS (SS>22; N=80). The prespecified primary endpoint was the composite of cardiovascular death, stroke, or myocardial infarction (MI).

Results: At one year, CAD severity was associated with higher rates of the primary endpoint (no CAD: 12.5%; low SS: 16.1%; high SS: 29.6%; p=0.016). This was driven by differences in cardiovascular death (no CAD: 8.6%; low SS: 13.6%; high SS: 20.4%; p=0.029), whereas the risk of stroke (no CAD: 5.1%; low SS: 3.3%; high SS: 6.7%; p=0.79) and MI (no CAD: 1.5%; low SS: 1.1%; high SS: 4.0%; p=0.54) was similar across the three groups. Patients with high SS received less complete revascularization as indicated by a higher rSS (21.2±12.0 vs. 4.0±4.4; p<0.001) compared with patients with low SS. On the other hand, the highest rSS tertile (rSS≥14) was associated with higher rates of the primary endpoint at 1 year (no CAD: 12.5%; low rSS: 16.5%; high rSS: 26.3%; p=0.045).

Conclusions: CAD is present in two-thirds of elderly patients with severe AS undergoing TAVI in routine clinical practice. Severity of CAD appears to be associated with impaired clinical outcomes at 1 year after TAVI. Patients with SS>22 receive less complete revascularization and have a higher risk of cardiovascular death, stroke, or MI as compared to patients without CAD or low SS.

TCT-729

The Role of Gait Speed as a Measure of Frailty in the Evaluation of Elderly Patients With Severe Aortic Stenosis for Treatment

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Background: Gait speed (GS) is an independent predictor of mortality after cardiac surgery, however association with clinical outcomes in patients with severe aortic stenosis (AS) undergoing surgical aortic valve replacement (SAVR) versus transcatheter AVR (TAVR) are limited.

Methods: From 3/2011-12/2012, all patients with severe AS evaluated by a multi-disciplinary heart team underwent standardization GS testing with the 5 meter walk test. Operative outcomes were assessed based on GS as both a continuous (m/s) and categorical (normal/slow) variable with immobile patients assigned a GS of 0 m/s. The primary end points were 30 days and one year mortality.

Results: We enrolled 285 patients (SAVR=76, TAVR=209). The optimal cutoff to discriminate slow from normal GS was 0.7 m/s (6.9/5m). Patients with normal GS had a higher survival at one year(Figure). Overall normal GS was an independent predictor of mortality at 30 days (OR 0.31, 95% CI 0.11-0.88; p=0.028) and one year (OR 0.34, 95% CI 0.12-0.99; p=0.048) with an 11% reduction in 30 day mortality for every 0.1m/s increase in walk speed. For one year mortality the STS PROM had an AUC=0.681, increasing to 0.704 with GS added. GS was an independent predictor of 30 day mortality after TAVR but not SAVR; with no significant association with mortality in the individual groups at one year.

Conclusions: GS is an independent predictor of mortality in patients with severe AS undergoing therapy including TAVI, but adds minimal additional predictive information to the STS risk score. Patients with slow GS or immobility should be carefully evaluated and counseled regarding mortality risk.

TCT-735

Trans-Catheter Aortic Valve Implantation – Preservation Of Right Ventricular Function

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Background: Right ventricular (RV) function is reduced after surgical aortic valve replacement (S AVR). The long-term effect on RV function following transcatheter aortic valve implantation (TAVI) is less well established. The aim of this study was to determine whether TAVI may preserve RV function at medium-term outcome.

Methods: We studied 79 consecutive patients (aged 83±7 years) with severe AS but no flow-limiting coronary artery disease, one week before and 12 months after transforamal TAVI with CoreValve. The TAVI group was compared with 36 patients (aged 70±3 years) who underwent sAVR for severe aortic stenosis (AS). RV inlet diameter measurement was averaged from apical 4-chamber and modified parasternal windows, and tricuspid annular plain systolic excrusion (TAPSE) was measured as the M-mode displacement of the tricuspid ring between the q wave of the ECG to pulmonay valve closure.

Results: The sAVR and TAVI groups had similar AS severity pre-operatively (mean aortic pressure drop 51±17mmHg vs. 49±15mmHg respectively, and valve area 0.7cm2 vs 0.6cm2, p=NS for both), though LVEF was reduced in TAVI patients (65±17% vs. 49±16%; p<0.001). There was no difference in RV size (33±6mm vs. 31±6mm), though TAPSE was greater in SAVR group (20±5mm vs. 15±6mm, p<0.001). At 12 months, mean aortic pressure drop decreased and aortic valve area increased in both sAVR and TAVI (to 10±3mmHg and 8±2mmHg respectively, and to 2±0.3cm2 vs. 1.8±0.2cm2, p<0.01 for both), though LVEF did not change (62±19% vs. 49±17%). Although RV cavity size did not change in either group, TAPSE decreased after sAVR (to 9±3mm) and increased after TAVI (17±4mm, difference p<0.001).

Conclusions: At medium-term follow-up, RV function deteriorates after sAVR but does not worsen after transforaminal TAVI. Therefore, patients with AS and pre-existing RV dysfunction may benefit preferentially from TAVI. Though clinical significance remains to be determined, RV function should be incorporated into risk score pre-procedure.