number of patients are seen at smaller, non-specialized hospitals, who are experienced in cardiac catheterization and are interested to offer TAVI to their patients but lack the structural requirements and experience. We aimed to assess whether a collaborative performance of TAVI by external interventional cardiologists together with an experienced TAVI team may offer an opportunity to safely treat these patients, thereby overcoming the inherent learning curve by so-called "on-site proctoring".
Methods: 490 patients were treated by TAVI at our university hospital since 2005, 282 using TF access. 41 additional TF-TAVI cases were performed by two external interventionalists together with our institutional heart team. Procedural safety and outcome was analyzed and compared to our own TF experiences.
Results: In these 41 patients, TF-TAVI could be performed with procedural, 30-day and 1-year mortality rates of 2, 7 and 10%. These rates are similar to our own most recent results (last tertile: 1.2, 8 and 12%). 9 procedural complications occurred: 1 wire perforation with surgical conversion and procedural death, 1 major stroke, 1 coronary occlusion, 5 major vascular complications, 1 minor stroke. In addition to the procedural death, the patient with the major stroke and one vascular complication patient with life-threatening bleeding died within 30 days despite initially successful, interventional management. The other 4 pts. with vascular complications were treated by covered-stent implantation and recovered without sequelae, and the coronary occlusion was managed by immediate stentimplantation. Of note, the amount of vascular complications (12%) was higher than in our latest patient tertile (7%) but still lower than in our initial tertile (33%).
Conclusions: TF-TAVI can be performed with good results by external interventionalists in collaboration with an institutional heart team at a specialized TAVI-center. Our observation also supports the concept of "on-site" proctoring for new TAVI operators, especially regarding complication management.

TCT-874

Hemodynamic Assessment of Residual Paravalvular Aortic Regurgitation (PAR) after TAVI: Impact of Myocardial Supply-Demand Ratio (DPTI:SPTI) on Survival.

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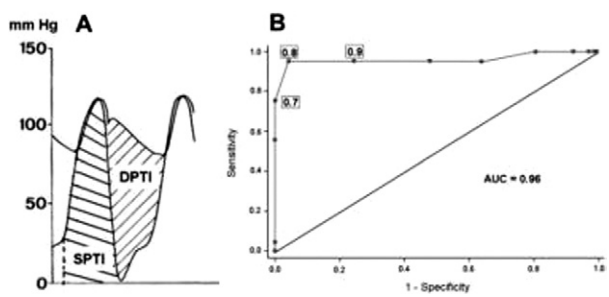
Background: Significant PAR has been shown to occur in 20% of pts. undergoing TAVI and associatd with increased cardiovascular mortality. Pathophysiologially, this may be explained by a reduced DPTI:SPTI, which is found in severe aortic stenosis. We sought to evaluate the already established cut-off value of 0.7 for assessing relevance of PAR.
Methods: Data of 167 consecutive TAVI pts. were analysed (ES: 79, MCV: 88), and PAR was graded angiographically. DPTI:SPTI was calculated based on planimetric integration of the diastolic area (diastolic pressure time index=DPTI) and the systolic area (systolic pressure time index=SPTI) (Fig. A).
Results: PAR was observed in 113 (67%) pts. 89 (78.8%) showed mild, 21 (18.6%) moderate and 3 (2.7%) moderate-to-severe PAR. Cardiovascular mortality at 30 days and 1-year was significantly increased in pts with moderate/moderate-to-severe PAR compared to those with no/mild PAR (50vs4.5% and 71vs6.9%, $p<0.05$). The already established cut-off value of ≤0.7 for DPTI:SPTI could be confirmed as an important quantitative parameter for prediction of cardiovascular mortality (Fig. B). 18 of the 24 pts. with moderate/moderate-to-severe PAR had a DPTI:SPTI ≤ 0.7.
Conclusions: A DPTI:SPTI ≤ 0.7 is highly predictive for cardiovascular mortality in the assessment of paravalvular PAR after TAVI. Though somewhat complex to calculate compared to previously proposed parameters (e.g. difference between diastolic aortic and LV enddiastolic pressure,it is independent from heart rate and reflects myocardial perfusion impairment, which offers a pathophysiological explanation for the increased mortality.



TCT-875

Frailty is a Major Determinant of Length of Stay After Transcatheter Aortic Valve Replacement

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Background: There are several risk-stratification tools for cardiac surgery including aortic valve replacement, but similar models are lacking for transcatheter aortic valve replacement (TAVR).
Methods: We retrospectively examined the clinical features and course of 45 patients who underwent transcatheter aortic valve replacement (TAVR) with the Edwards-Sapien valve for critical aortic stenosis at our center. All were inoperable for surgical valve replacement. Hospital length of stay (LOS) was calculated from the date of TAVR to the date of discharge and was expressed as mean ± SD. Pre-operative clinical variables were entered in a Cox-hazard proportional model for LOS. Among these variables, the frailty index was scored with 1 point assigned for each: serum albumin <3.5 mg/dl, in-ability to independently perform at least 4 of 6 Katz activities of daily living, inability to walk 5 meters in less than 7 sec, and grip strength < 18 kg. Patients with ≥ 3 points were considered frail.
Results: The mean LOS for all 45 patients was 9.9 ± 6.9 days. Multivariate predictors of length of stay are illustrated in the table. A total of 22 (49%) were categorized as frail as per our index definition. Mean LOS was 12.1±8.4 days among frail patients vs 7.7 ± 4.0 days among non-frail patients (p=0.029).

Parameter	OR	OR (95%CI)	p value
Age (yrs)	2.071	1.221–3.332	0.005
Frailty	5.910	3.730–10.471	0.015
Pre-operative Hemoglobin (g/dl)	0.048	0.015–0.916	0.041
Pre-operative Creatinine (mg/dl)	0.001	0.000–0.006	0.008
Pre-operative Ejection fraction	1.350	0.796–1.965	0.330
Underlying Moderate –Severe lung disease	0.178	0.030–1.067	0.059

Conclusions: Our study suggests that frailty is not only a marker for inoperability for surgical aortic valve replacement, but is also predictive of prolonged recovery among patients undergoing transcatheter aortic valve replacement for critical aortic stenosis. This information can be used not only for optimal patient selection but also for counseling patients about realistic post-operative goals and expectations.

TCT-876

Decreasing B – Type Natriuretic Peptide Predicts Survival After Transcatheter Aortic Valve Replacement.

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Background: B-type natriuretic peptide (BNP) is released in response to increased myocardial wall stress and its levels are known to increase in diastolic and systolic heart failure. Heart failure related to severe aortic stenosis is expected to improve after valve replacement. We examined the relationship between BNP and survival after Transcatheter Aortic Valve Replacement (TAVR).
Methods: We retrospectively reviewed 48 patients who underwent TAVR and had NT proBNP measured 1 day before (preBNP) and 30 days after TAVR (postBNP). Vital and clinical status was assessed 1, 6, 12, and 24 months after TAVR. DeltaBNP was calculated (= postBNP – preBNP). Death from any cause was the primary outcome. We calculated a hazard ratio (HR) of mortality using the Cox proportional multivariate model.
Results: The median deltaBNP was (−)2161 pg/ml (Range: decrease of (−)17,481 pg/ml to increase of (+)17,754 pg/ml). This median value divided the patients into those with (n=24) or without (n=24) deltaBNP decrease greater than (−)2000 pg/ml. PreBNP did not correlate with survival (p=0.264), but a BNP decrease of more than 2000 pg/ml was strongly associated with survival (HR = 0.15, CI (0.05 - 0.49) p<0.01); (Figure 1).

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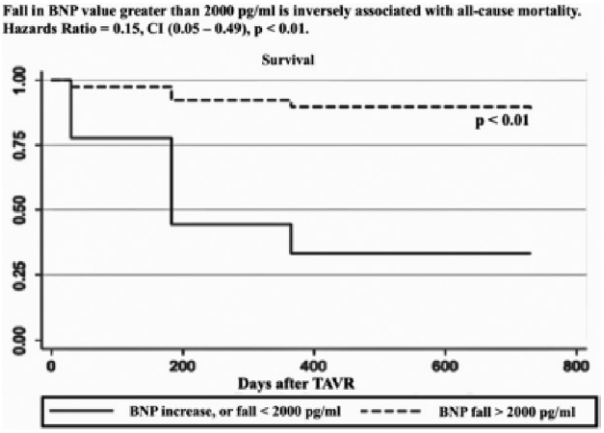

Conclusions: In this series of patients undergoing TAVR and having sequential BNP measurements, baseline BNP did not predict survival, but BNP decreasing by more than 2000 pg/ml 30 days after TAVR was a strong predictor of survival.

TCT-877

Historical Trends in Outcomes following Aortic and Mitral Heart Valve Replacement Procedures: A Population-Based Study of 29,582 Medicare Patients from 1997 to 2009

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Background: To serve as comparative data for percutaneous replacement, the purpose of this study was to characterize the historical outcomes for aortic and mitral valve replacement surgery in a large, nationally representative patient population.
Methods: Patients undergoing aortic or mitral valve replacement were identified from the 5% national Medicare data (1997-2009) using ICD-9-CM codes 35.21 to 35.24. The subsequent rates of mortality, mechanical complications, infection, and valve re-implantation/reoperation, and infective endocarditis were evaluated. Hospitalization charges and reimbursements (in Jan 2011 dollars) for the index procedure were also assessed.
Results: The patient cohort included 12,202 aortic bioprosthesis, 9,757 aortic mechanical valves, 3,222 mitral bioprosthesis, and 4,401 mitral mechanical valves. The ten-year Kaplan-Meier mortality, mechanical complication, infection, re-implantation/reoperation, and infective endocarditis rates for aortic bioprosthesis were 64.4%, 4.41%, 4.54%, 1.50%, and 8.34%, respectively, and for aortic mechanical valves were 63.9%, 5.23%, 4.71%, 1.84%, and 9.08%, respectively. The corresponding ten-year Kaplan-Meier rates for mitral bioprosthesis were 74.8%, 8.02%, 6.29%, 2.81%, and 12.90%, respectively, and for mitral mechanical valves were 64.7%, 7.60%, 6.06%, 2.87%, and 12.24%, respectively. The average hospitalization reimbursements for procedures involving aortic bioprostheses, aortic mechanical valves, mitral bioprostheses, and mitral mechanical valves were $54.3k, $54.6k, $64.1k, and $62.2k, respectively.
Conclusions: The crude risk of mortality and complications, as well as payer costs, were found to be higher for mitral valve replacements compared with aortic valve replacements. This study provides baseline data for evaluating the comparative effectiveness of percutaneous valve replacement to "traditional" approaches, especially since the percutaneous approach may have inherently different levels of performance or expanded indications.

TCT-878

TransAortic Valve Implantation (TAVI) Normalises Subendocardial Function in Patients with Severe Aortic Stenosis

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Background: Long-standing aortic stenosis (AS) causes left ventricular (LV) dysfunction, which may improve after trans-catheter aortic valve implantation (TAVI). The LV subendocardium is composed of longitudinal fibres which are highly sensitive to ischaemia caused by high LV filling pressures. Measurement of long axis systolic amplitude is an easy measure of subendocardial function. The aim of this study was to assess the nature of subendocardial abnormalities in AS and their response to TAVI.
Methods: We studied 46 consecutive patients (age 82±7 years) with severe AS but no flow-limiting coronary artery disease, one week before and 6 months after TAVI. LV ejection fraction (LVEF) was calculated using Simpsons biplane methods. LV subendocardial dysfunction was studied from long axis M-mode amplitude at the lateral, septal, and posterior sites. Systolic amplitide was measured as displacement of the mitral ring between the q wave of the ECG to aortic valve closure. Incoordination (post-ejection shortening: PES) was measured as amplitude of further inward motion after aortic valve closure. LV diastolic function was assessed by mitral filling velocities (early diastolic: E wave, and late diastolic: A wave). Averaged values for lateral, septal, and posterior sites are presented, and values were compared to 17 normal controls.
Results: In controls, LVEF was 65±7%, long axis systolic amplitude and velocity were 14±3mm and 7±2cm/s, there was no PES, and E:A ratio was 1.0±0.3. In patients before TAVI, LVEF, long axis systolic amplitide and velocities were lower than controls (46±19%, 6.5±2.1mm, 4.1±1.9cm/s respectively), PES was present (3±1mm) and E:A was higher than controls (3.3±4.6, all $p<0.01$). After TAVI, LVEF did not change (49±17%), but long axis systolic amplitide and velocities increased (to 9.2±2.3mm, and 6.7±2.1cm/s); PES increased (to 5±2mm) and E:A ratio fell (to 2.1±1.4).
Conclusions: Relief of AS following TAVI causes improvement in LV subendocardial function manifest as increased long axis systolic amplitude and velocity. However reduction in LV-EDP also permits appearance of incoordination, with associated abnormal diastolic function, that may require exclusion of epicardial coronary obstruction.

TCT-879

SIMPLIPHieDE (Single center IMPella LVAD supported Pci in High Risk group of patients – Detroit Medical Center Experience) Balloon Aortic Valvuloplasty – Technique and Clinical Outcomes

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Background: Advances in cardiovascular care has a significant impact on changing the landscape of valvular heart disease. Balloon aortic valvuloplasty (BAV) considered to be of palliative role become of essential importance in the era of TAVI. Patients with severe aortic stenosis and poor surgical candidacy not yet qualifying for TAVI still require BAV as a main therapeutic tool. The hemodynamic stress of BAV on those with profound ventricular dysfunction, however, requires circulatory assistance to permit periprocedural survival.
Methods: We evaluated the short term safety and efficacy of using Impella left ventricular assist device in extremely high-risk patient underoing aortic valvuloplasty procedure. 13 patients with severe critical aortic stenosis and multiple co-morbidities underwent BAV at our institute, 53% patients had concomitant coronary interventions out of which 38% had multivessel PCI . Because of advanced age, multiple co-morbidities and poor cardiac reserve & hemodynamic status, the BAV's were supported with the Impella.We describe a technique in which a single 14 french retrograde arterial access was obtained and after crossing the aortic valve, a 0.035″ J-wire with LV curve along with a 0.014″ Impella wire was left in the LV cavity. The impella device is primed and loaded on the 0.014 wire ready to go in case of a hemodynamic compromise. After balloon aortic valvuloplasty with rapid ventricular pacing is done, the Impella LVAD is rapidly railed into the LV for hemodynamic support.

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