changed at times during the course of a procedure (although measurements were only made when a steady state was achieved), the resulting repeated CO measurements were closely correlated (R=0.93; ICC=0.96). In regards to AVA, although there was good correlation in AVA calculated from repeated assumed VO2 CO (R=0.85; ICC=0.89) and TD CO (R= 0.93; ICC=0.94), AVA based on direct VO2 CO was very reproducible (R=0.99;ICC>0.99).

CONCLUSIONS Cardiac output and AVA calculated from directly measured VO2 varies substantially from those based on assumed VO2 values and thermodilution, which are the default methods used in most CCL. Directly measured VO2-derived CO gives highly reproducible valve area measurements and may be more accurate.

CATEGORIES STRUCTURAL: Valvular Disease: Aortic

KEYWORDS Aortic stenosis, Cardiac Output, Hemodynamics

TCT-620

Shift Of Patient Selection For Balloon Aortic Valvuloplasty After Introduction Of Transcatheter Aortic Valve Replacement: Insights From A Single-center Registry

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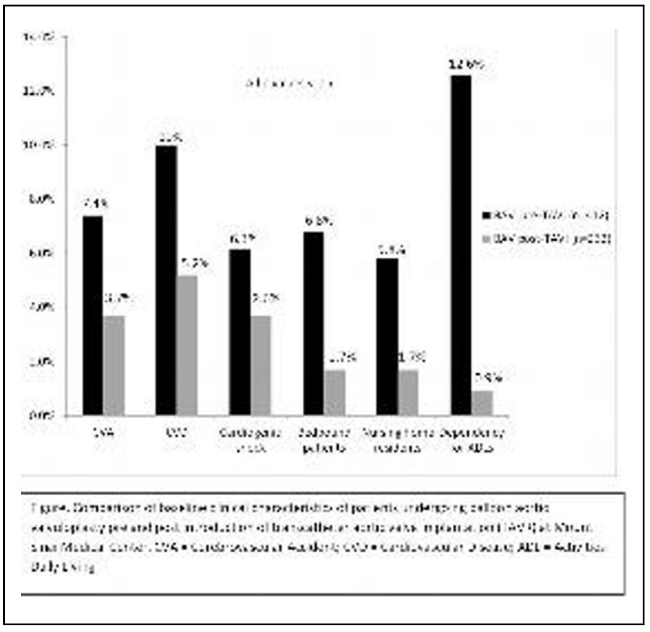
BACKGROUND Patients with severe aortic stenosis (AS) who are unsuitable for surgical aortic valve replacement have historically been treated with balloon aortic valvuloplasty (BAV). Subsequent to the introduction of transcatheter aortic valve replacement (TAVR) for high risk patients, BAV became an option as a bridge to TAVR. We sought to describe the baseline clinical characteristics and outcomes of patients undergoing BAV after the introduction of TAVR.

METHODS We identified 644 patients undergoing BAV from 2007 to 2012 at Mount Sinai. We compared clinical and procedural characteristics, in-hospital outcomes, and mortality at 1-year in patients undergoing BAV pre and post-introduction of TAVR.

RESULTS Patients undergoing BAV pre-TAVR (n = 412, 64%) had a significantly higher incidence of prior cerebrovascular accident and cardiovascular disease (Figure 1). These patients also had a higher presentation of cardiogenic shock (6.3% vs. 2.6%, p<.01) and frailty indicators, evidenced by more nursing home residents (5.8% vs. 1.7%, p<.02), and dependency for all activities of daily living (ADLs) (12.6% vs. 0.9%, p < .001). There was a slight, somewhat significant decrease in mortality at 1-year (pre-TAVR 28.5% vs. post-TAVR introduction 25.3%, p = 0.09).



CONCLUSIONS The introduction of TAVR has significantly impacted patient selection for BAV. Whether the observed mortality benefit post-introduction of TAVR is attributable to patient risk profile or the contribution of TAVR warrants further investigation.

CATEGORIES STRUCTURAL: Valvular Disease: Aortic

KEYWORDS Balloon aortic valvuloplasty

TCT-621

The Synergistic Impact of Eccentric and Incomplete Stent Deployment on Transcatheter Aortic Valve Leaflet Stress Distribution

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BACKGROUND Transcatheter aortic valve replacement (TAVR) is an established treatment in in-operable and high-risk patients with severe symptomatic aortic stenosis. The current guidelines for TAVR are to upsize transcatheter aortic valve (TAV) relative to the native annulus to secure the device and minimize paravalvular leakage. The range of annulus size for TAVR suggests that not all patients will achieve complete TAV expansion to the manufactured size, and some degree of incomplete stent expansion may exist. In addition, aortic annulus is elliptical rather than circular, and non-circular TAV deployment has been observed following TAVR. Nevertheless, the clinical importance of TAV under-expansion or eccentricity, and their impact on the long-term valve durability is unknown. The aim of this study was to determine the synergistic impact of eccentric and incomplete stent deployment on TAV leaflet stress distribution under dynamic loading.

METHODS A 23mm TAV was created based on the Edwards SAPIEN XT. The TAV was crimped and balloon-expanded in an acrylic template to reach eccentricity of 0.0, 0.5 and 0.75 in the presence of none (0 mm), mild (2 mm), and moderate (4 mm) valve oversizing. Leaflet geometry in each configuration was obtained using 3D Laser Scanner. Furthermore, a biaxial stretching system was used to determine mechanical properties of the bovine pericardium patch used to create the 23mm TAV. The resultant stress-strain data was then fit to the Fung's strain energy function to consider material anisotropy. A large deformation analysis was performed using ABAQUS/Explicit package. A transvalvular pressure waveform measured from in-vitro tests in a pulse duplicator was applied to the leaflets.

RESULTS After complete expansion of the TAV to 23mm with zero eccentricity, high stress regions were observed primarily in the commissures during diastole, and the maximum principal stress reached to 2.52MPa. However, after incomplete expansion of the 23mm TAV to diameters of 21 and 19mm with no eccentricity, the maximum principal stress in the fully-closed position reached to 3.53MPa in the commissures, and 2.60MPa in the belly region, respectively. On the other hand, in the presence of 0.5 eccentricity, the maximum principal stress in the commissures was increased by 56%, 95%, and 32%,