TCT-782

Single-center experience using three different second generation devices for transcatheter aortic valve implantation

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Background: Transcatheter aortic valve implantation (TA-AVI) has become well accepted alternative treatment for patients with severe aortic stenosis and high surgical risk. While first generation devices yield acceptable clinical and hemodynamic outcomes, second generation devices have become available, potentially facilitating implantation procedures and improving postoperative outcome.

Methods: From March 2008 through December 2012, a total of 420 patients were treated by TA-AVI at our center. Of these, 142 patients (80.3% of 1,61% years, 60% male, 19.3:19.8% logEuroSCORE I) received second generation devices for TA-AVI (TA-2nd; JenaValve n=63, Symetis Acura n=38, Medtronic Engager n=41). Data were prospectively entered into a dedicated database and retrospectively analyzed.

Results: In 142 patients, after TA-AVI2nd, procedure time, fluoroscopy time and amount of contrast used were 92.2±41.9 min, 7.4±1.4 min and 168.3±82.4 ml respectively. Acute device success was achieved in 97.2% (138/142), 30-day mortality was 4.2% (6/142), periprocedural stroke rate was 1.4% (2/142). The degree of paravalvular leakage at discharge was 0.5±0.6 with PVL ≥ grade 2 in four patients only (2.8%). At discharge, transvalvular gradients were mean/min: 10.8±4.1 / 21.4±7.6 mmHg respectively.

Conclusions: TA-AVI2nd using JenaValve, Symetis Acura and Medtronic Engager devices yield excellent acute clinical and hemodynamic outcomes in this early single-center experience. Ease of implantation and good functional outcome with low rates of relevant PVL appear to be the most obvious improvements compared to first generation devices. TA-AVI2nd devices may eventually lead to a patient-centered tailor-made approach to transcatheter treatment of aortic stenosis in high-risk patients. Before recommendations on which device is best suited for which patient can be made, experience in larger patient numbers and with longer follow-up will have to be awaited.

TCT-783

Transient and Permanent Cardiac Conduction Abnormalities Following Transcatheter Aortic Valve Implantation

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Background: In transcatheter aortic valve implantation (TAVI), conduction abnormalities (CA) may complicate the peri- and postoperative patient management and outcome. Herein, both atrio-ventricular and intra-ventricular CA occur, and trigger permanent pacemaker (PP) implantation in some patients. Within the time course of postprostheticventricular healing, CA may in part be reversible.

Methods: Out of 121 patients that underwent TAVI, a total of 69 patients were identified with no baseline ventricular conduction disturbances or previous PP implantation. TA-AVI was performed in 31 patients (41). Data of the remaining patients fulfilling the device success criteria were: in-hospital mortality in 2 patients (4.2%), significant prosthetic aortic regurgitation in 4 patients (8.5%) and second valve implantation in 10 patients (21.3%) (8 cases of malpositioning with high-grade aortic regurgitation, 1 acute and 1 delayed valve dislocation). Mean and peak transaortic gradients decreased significantly (p < 0.001). The rate of pacemaker implantations was 31.9%.

Conclusions: In this retrospective multi-center registry, transcatheter treatment of severe aortic valve stenosis with the Medtronic CoreValve 31mm device appeared to be challenging, even in experienced hands. If the prosthesis is properly implanted, it offers adequate valve hemodynamics and proper functioning.

TCT-785

The “Eyeball Test” in Aortic Stenosis: Characterizing Subjective Frailty with Objective Measures

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Background: Assessment of frailty complements traditional risk assessment in high-risk older adults with aortic stenosis (AS). Subjective frailty assessment is widely used, but its associations with objective markers of frailty are poorly characterized.

Methods: Frailty was subjectively assessed by an interventional cardiologist or physician assistant in high risk older adults with AS in the valve clinic at our center. A trained coordinator then objectively assessed frailty by measuring 15 foot walk time, grip strength, independence in activities of daily living (ADL), and collecting serum albumin as a marker of malnutrition. Markers of frailty were compared between those considered frail and not frail by the subjective assessment.

Results: Among 92 patients, 28 (30%) were considered frail by subjective assessment. Those considered frail were older (86.1±8 vs 84.6 yrs, p=0.06) with higher STS scores (9.8±4.4 vs 7.2±3.0, p=0.009), but did not differ in gender (64% vs 50% female, p=0.2), or BMI (25.6±7.3 vs 25.5±4.2, p=0.97). The frail group had more ADL dependence (79 vs 36%, p=0.0002), slower gait speed (0.37±0.16 vs 0.67±0.17 m/s, p<0.0001), lower grip strength (women: 12.6±4.9 kg vs 16.3±4.9 kg, p=0.01, men: 18.0±7.9 vs 26.5 kg, p=0.01), and lower albumin (3.6±0.48 vs 4.0±0.48 g/dL, p<0.0001).

Conclusions: In frailty, objective markers of frailty were slower, weaker, more malnourished, and had more ADL impairment. Future studies will be needed to determine the optimal frailty assessment to predict outcomes in older adults with AS.