Poster n°5

## Outcome of normal flow low gradient ''severe'' aortic stenosis with preserved left ventricular ejection fraction: A propensity matched study

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*Introduction* Normal-flow low-gradient severe aortic stenosis (NF-LG-SAS), defined by aortic valve area < 1 $cm^2$, mean gradient < 40 mmHg and indexed stroke volume > 35 $ml/m^2$, is the most prevalent form of low-gradient aortic stenosis (AS). However, the true severity of AS and the management of NF-LG-SAS is controversial. The aim of this study was to evaluate the outcome of patients with NF-LG-SAS compared to patients with moderate AS (MAS), who are considered to be suitable for conservative management.

*Method* A total of 520 patients were included in this study: 154 with NF-LG-SAS and 366 with MAS (aortic valve area between 1.0 and 1.3 $cm^2$). The study endpoint was overall survival in medically and surgically managed patients after diagnosis in echocardiography. Propensity score matching was performed in 226 patients (113 patients in each group).

*Results* On Cox multivariate analysis, after adjustment for covariates of prognostic importance, NF-LG-SAS patients did not exhibit an excess risk of mortality compared to MAS patients, under medical management ($P = 0.45$) and under medical and surgical management ($P = 0.70$), even after further adjustment for aortic valve replacement (AVR) ($P = 0.56$). The 6-year cumulative incidence of AVR (performed in accordance with current guidelines) was comparable between the two groups ($39 \pm 4\%$ for NF-LG-SAS and $35 \pm 3\%$ for MAS, $P = 0.10$). After propensity score matching ($n = 226$), NF-LG-SAS patients and MAS patients also had comparable outcomes under medical ($P = 0.41$), and under medical and surgical management ($P = 0.52$).

*Conclusion* This study shows that NF-LG-SAS have a comparable outcome to that of MAS when AVR was performed during follow-up according to guidelines, mostly at the stage of high-gradient AS. Rigorous echocardiographic assessment to rule out measurement errors and close follow-up are essential in NF-LG-SAS to detect progression to true severe AS. Overall survival in propensity matched population (Fig. 1).

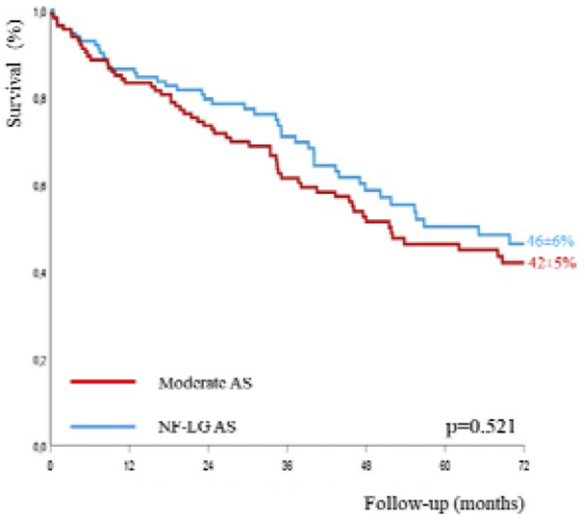


*Fig. 1*

*Disclosure of interest* The authors declare that they have no competing interest.

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Poster n°9

## A reappraisal of bioprosthetic structural valve degeneration after surgical aortic valve replacement: mode, determinants, effect of treatment and outcome

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*Introduction* Structural valve degeneration (SVD) of surgical bioprostheses (BP) is increasingly diagnosed. We aimed to reappraise aortic BP SVD mode, determinants, effect of treatment and outcome.

*Method* A total of 262 SVD patients ($78 \pm 9$ years, 53.4% males) were enrolled. The mode and determinants of SVD were investigated by echocardiography, surgical and macroscopic evaluation. Mortality and the effect of treatment were assessed.

*Results* The predominant mode of SVD was stenosis (58%). The annualized rate of increase in mean gradient was $4.6 \pm 3.2$ mmHg/year in stenotic SVD. In multivariable analysis, predictive factors of an earlier SVD were age ($P < 0.001$), creatinine clearance ($P < 0.0001$), early post-operative effective orifice area ($P = 0.011$) and mean gradient ($P < 0.0001$), BP type (Stentless/Stented porcine/Stented pericardial, $P = 0.009$) and a specific type of BP ($P < 0.0001$). Seventy (26.7%) patients underwent exclusive medical care (Medical), 79 VinV (30.1%) and 113 (43.1%) Redo-Surgery. In explanted BP ($n = 113$) moderate to severe calcifications was found in 83.2%. Leaflet fibrosis, as a component of SVD, was found in 23.9% of BP. Out of 19 (16.8%) BP with no or minimal calcification (NoCalcif) 7 had fibrotic stenosis (36.8%). At 4 years, overall survival was improved by invasive management ($74.0 \pm 6.6\%$ vs. $55.7 \pm 6.9\%$, $P = 0.01$). In multivariable analysis predictors of overall survival were Redo-S (HR 0.47, $P = 0.028$), VinV (HR 0.37, $P = 0.014$), and Nt-pro-BNP > 3000 (HR 2.22, $P = 0.004$).

*Conclusion* The rate of SVD progression is 4 to 5 mmHg/year on average. BP type and post-operative hemodynamic are predictors of faster SVD. NoCalcif accounts for > 15% of SVD. Leaflet fibrosis is a component of SVD. Redo-surgery and VinV are associated with a better outcome, independently of failure mode, and should be considered in most SVD patients.

*Disclosure of interest* The authors have not supplied their declaration of competing of interest.

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**Poster n°10**

## Impact of non-severe degenerative mitral stenosis on morbidity and mortality in patients with severe aortic stenosis undergoing transcatheter aortic valve replacement

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*Introduction* Severe degenerative mitral stenosis (DMS) is a known predictor of mortality in patients with symptomatic aortic stenosis (AS) considered for transcatheter aortic valve replacement (TAVR) but little data exist regarding mild to moderate DMS. We assessed the association of DMS with mitral annulus calcification (MAC) and evaluated the association of non-severe DMS and MAC with morbidity and mortality in patients with severe AS undergoing TAVR.

*Method* In a retrospective cohort of 346 patients with isolated severe AS undergoing TAVR, we evaluated the association of different DMS severities (based on transmitral mean pressure gradient (TMPG, mmHg)) and MAC severity with all-cause mortality and cardiovascular (CV) hospitalization/death. Severe DMS (TMPG > 10 mmHg) was excluded from the analysis.

*Results* Non-severe DMS (TMPG > 2 mmHg) was present in 42% of patients ($n = 147$) and moderate to severe MAC in 46% ($n = 131$). Patients with TMPG > 2 mmHg were predominantly female (66.7% vs. 41.7%, $P < 0.001$) with a higher LVEF and smaller diastolic LV volume than patients with no DMS ($P < 0.05$). In a multivariate analysis, TMPG (> 2 mmHg) and MAC (moderate to severe) were found to be independent predictors of mortality (HR = 1.17 [1.02—1.35], $P = 0.0245$ and HR = 2.01 [1.18—3.44], $P = 0.01$ respectively).

*Conclusion* Non-severe DMS is frequently associated with MAC in patients with severe AS undergoing TAVR. In the challenging context of DMS and MAC in patients undergoing TAVR, TMPG > 2 mmHg appears as an independent prognostic factor that discriminates high-risk patients.

*Disclosure of interest* The authors have not supplied their declaration of competing interest.

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**Poster n°11**

## Normalized stroke volume in severe aortic stenosis with preserved ejection fraction: Reference values and outcome implications

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*Introduction* Appropriate normalization methods to scale Doppler-derived stroke volume (SV) in patients with aortic stenosis (AS) are poorly defined and reference values are lacking. We aim to establish reference values for normalized SV, to compare the prognostic value of SV normalized by different methods in AS and to examine the outcome of low-flow(LF) low-gradient(LG) AS with preserved ejection fraction(LVEF) based on newly defined reference values.

*Method* In 2781 normotensive adults without cardiovascular disease we defined normal relationships between SV and body size by nonlinear regression. We analyzed the prognostic performance of ratiometric and allometric normalized SV in 1450 patients with severe AS and preserved LVEF.

*Results* The allometric exponents that described the SV-height (H) and SV-body surface area (BSA) relationships were 1.32 and 0.88, respectively. In males, LF reference values were: < 28 ml/$m^2$, < 30 ml/m, < 30 ml/$(m^2)\hat{0}.88$, and, respectively, < 26 ml/$m\hat{1}.32$, and in females < 27 ml/$m^2$, < 28 ml/m, < 29 ml/$(m^2)\hat{0}.88$, and, respectively, < 24 ml/$m\hat{1}.32$. In patients with severe AS, SV/$H\hat{1}.32$ was most consistently associated with mortality and showed better prognostic performance than other normalized SV parameters. Compared to H-normalization, BSA-normalization markedly overestimated the frequency of LF(3% vs. 9%). In 1354 AS patients managed initially medically, LF/LG AS defined based on the 35 ml/$m^2$ cut-off showed better outcome than high gradient(HG) AS (adjusted HR 0.85[0.62—0.96]). When new reference values were used, the mortality risk of LF/LG AS was higher than that of HGAS (adjusted HR 1.37[1.06—1.89] for SV/BSA and adjusted HR 1.42[1.10—2.15] for SV/$H\hat{1}.32$).

*Conclusion* We provide reference values and appropriate normalization methods for SV by Doppler-echocardiography. Patients with LG severe AS, preserved LVEF and ''true'' LF are at high-risk of death during follow-up. (Fig. 1)