TOPIC 28 – Valvulopathies – A

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Baseline NT-proBNP and the impact of more than mild aortic regurgitation after transcatheter aortic valve implantation

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Background: Aortic regurgitation (AR) is an important complication of transcatheter aortic valve implantation (TAVI) and even moderate AR is associated with increased mid-term mortality after TAVI. This association with decreased survival is poorly explained. We sought to analyse the impact of AR on mortality after TAVI as a function of baseline NT-proBNP (NTBNP).

Methods: We included 222 consecutive patients from our single centre registry, all implanted with the Edwards valve, via the transfemoral route. AR severity was evaluated by transthoracic echocardiography. NTBNP was measured 24 hours before implantation and patients were divided in 2 groups according to the median NTBNP value.

Results: Mean age was 83.6±7 years and 131 (59%) were women. Patients with low NTBNP had higher left ventricular ejection fraction: 62±11% vs 49±17%, p<0.001, smaller telediastolic: 52 mm (48 - 56) vs 57 mm (48 - 61), p=0.002 and telesystolic diameters: 32 mm (28 - 36) vs 39 mm (33 - 48), p<0.001, but a similar mean aortic gradient: 45±14 mmHg vs 46±20 mmHg, p=0.75. Baseline AR ≥2 was less frequent in the low NTBNP group: 26% vs 44%, p=0.005. After TAVI, AR ≥2 occurred in 27% and was significantly associated with increased 1-year mortality only in the low NTBNP group (Figure).

Conclusion: More than mild AR after TAVI was associated with increased 1-year mortality only in patients with low baseline NTBNP. Our data suggest that the impact of AR after TAVI is absent in patients with remodelled ventricles and more severe baseline AR.

Figure – Abstract 213 – Mortality at 1 year stratified by AR and NTBNP

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Is pre-TAVI EP study useful to predict risk of post-procedure pacemaker implantation?

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Introduction: Recent studies have shown that transcatheter aortic valve implantation (TAVI) can induce severe conduction disorders. However, the usefulness and the time of electrophysiology (EP) study is still unclear.

Methods: This single-center prospective study took place from December 2010 to May 2012 and included 81 patients. An ECG was realized before, immediately after and 24 hours after the procedure along with the registry of the electric modifications during the procedure. EP study was realized before and/or after TAVI. A follow up at one month with an ECG and clinical advents has been realized.

Results: Out of the 81 patients, 74% were implanted with an Edwards valve and 26% with a Corevalve. The pacemaker implantation rate was respectively 16% and 35% (p=0.03), 30% of them underwent an EP study before and after TAVI. Risk factors correlated to a higher risk of permanent pacing are male gender (p=0.04), pre-existing right bundle branch block (p<0.001), PR>200 ms (p=0.008), QRS width >120 ms (p=0.01), left axis deviation (p=0.003), larger valve diameter (26mm vs 24mm; p=0.04), prolonged HV interval (67.7 vs 57 ms; p=0.01), Corevalve (p=0.03), and renal insufficiency (p=0.04). The HV interval was significantly prolonged after TAVI (58.9 ms to 68.8ms, p=0.007). None of the patients with an initial HV interval below 60ms was implanted with a pacemaker. Furthermore, no patient with a pre-TAVI QRS width below 120 ms and a HV interval below 65 ms necessitated pacemaker implantation with a 100% positive predictive value.

Conclusions: Some clinical and EP factors seem to be identified as risk factors for the implantation of a pacemaker post TAVI, such as male gender, a pre-TAVI wide QRS particularly RBBB, a prolonged PR interval, chronic renal failure, a larger valve diameter and the use of a Corevalve. QRS width combined to a pre-TAVI EP study appears to predict the risk of pacemaker implantation. However, these results need to be confirmed by larger studies.
Balloon aortic valvuloplasty in the era of transcatheter aortic valve replacement: acute and long-term outcomes

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Background: The use of balloon aortic valvuloplasty (BAV) has resurfaced since the development of transcatheter aortic valve replacement (TAVR). The aim of our study was to determine the procedural and long-term outcomes of patients treated by BAV in the early TAVR era.

Methods: From 2005 to 2008, 323 consecutive patients presenting with severe aortic stenosis were treated by BAV in our institution.

Results: Mean age and logistic EuroSCORE were 80.5±9.9 years and 28.7±12.5 %, respectively. The effective orifice area increased from 0.68±0.25 to 1.12±0.39 cm2 (p<0.001) after BAV. In-hospital major complications occurred in 26 patients (8.0%), with a mortality rate of 2.5%. Eighty-five patients (26.3%) were bridged to surgical aortic valve replacement (SAVR, 9.6%) or TAVR (16.7%). Twenty-eight patients (8.7%) had at least one repeat BAV. Two hundred and ten patients (65%) received only medical therapy post-BAV. Mean duration of follow-up was 20.7±20.0 months. Kaplan–Meier analysis demonstrated that survival after single BAV was poor. Patients treated by BAV followed by SAVR or TAVR had the highest long-term survival rate. Redo-BAV presented a significant survival advantage compared to single BAV. Multivariate analysis revealed that logistic EuroSCORE, severe aortic regurgitation and stroke complications post-BAV were independent predictors of mortality. In contrast, bridge to SAVR or TAVR, as well as redo BAV were independent predictors of survival.

Conclusions: The results of our study suggest that BAV is an acceptable bridge to SAVR or TAVR in a very high-risk population not immediately suitable for definitive therapy. Interestingly, redo BAV may be proposed as an alternative strategy in patients with persistent contraindications to SAVR and TAVR.

Performance analysis of EuroSCORE II compared to the original logistic EuroSCORE and STS scores for predicting 30-day mortality after transcatheter aortic valve replacement

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The original EuroSCORE has been recently updated by EuroSCORE II to optimize its efficacy in cardiac surgery but its performance has never been evaluated for predicting 30-day mortality in patients undergoing transcatheter aortic valve replacement (TAVR). Consecutive patients (n=250) treated by TAVR were included for analysis. Transapical (TA) access was used in 60 patients, while 190 procedures were performed using a transfemoral (TF) approach. Calibration (risk-adjusted mortality ratio, RAMR) and discrimination (c- and u-statistics) were calculated for the logistic EuroSCORE, EuroSCORE II, and Society of Thoracic Surgeons (STS) scores for predicting 30-day mortality. The observed mortality was 7.6% in the overall population (6.3% and 11.7% for the TF and TA cohorts, respectively). Predicted mortality was 22.6±12.8 % by logistic EuroSCORE, 7.7±5.8 % by EuroSCORE II, and 7.3±4.1 % by STS score. RAMR was 0.34 (95% CI 0.10-0.58) for logistic EuroSCORE, 0.99 (95% CI 0.84-1.03) for EuroSCORE II, and 1.05 (95% CI 0.94-1.17) for STS score. A moderate discrimination was observed with EuroSCORE II [0.66 (95% CI 0.53-0.79), p[=0.012] as compared to logistic EuroSCORE [0.63 (95% CI 0.51-0.76), p[=0.06] and STS [0.58 (95% CI 0.43-0.73), p[=0.23] scores without significant difference among the 3 risk-scores. Discrimination was slightly better in the TF as compared to the TA cohort with the 3 risk-scores. In conclusion, EuroSCORE II and STS scores are better calibrated than the logistic EuroSCORE but have moderate discrimination for predicting 30-day mortality after TAVR.

Survival of patients with aortic stenosis referred but not receiving percutaneous aortic valve replacement

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Background: Transcatheter aortic valve replacement (TAVR) is a new treatment alternative for patients with severe symptomatic aortic stenosis (AS) who are poor candidates for surgical aortic valve replacement.

Objective: To determine the survival of patients with severe symptomatic AS who were referred for inclusion in French TAVR trials using the Edwards SAPIEN (Edwards Lifescience, Irvine, CA) valve from April 1, 2006 to November 30, 2007, but who have not undergone the procedure.

Methods: 140 patients with severe symptomatic AS were referred for possible TAVR to Rouen University Hospital. Of these Pts, only 38 were implanted, while 51 were excluded and 51 were awaiting implantation. Those 102 Pts represented our study group. Demographic, clinical and hemodynamic variables were assessed. Survival, cause of death, and factors predicting these outcomes were analyzed. Only 2 Pts were lost for follow-up.

Results: One hundred and two patients (49 males and 53 females), mean age 85 years, were included and followed. During the follow-up period, finally 6 patients on the waiting list underwent TAVR, and 3 had surgical aortic valve replacement. Patients excluded from TAVR (n=51) had an observed median survival of 285 days (124-385). Patients waiting for valve implantation but who have not received TAVR or surgery (n=42), had a median survival of 609 days (383-763). The difference in survival between the two groups was not statistically significant (p=0.546, Log Rank). Mortality was associated with a higher logistic EuroSCORE (>25%, p=0.0027, >20%, p=0.075). Overall survival at 1 year was 67% in the waiting list (vs 45% for excluded patients, NS), and 22% at 3 years (vs 21%, NS).

Conclusion: Patients considered for TAVR have a high rate of early mortality without treatment. Risk stratification may help to select patients for TAVR.
Decline of platelet count following TAVI: incidence, mechanism and prognostic importance

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Background: Decrease in blood platelet count has been described following percutaneous coronary intervention (PCI) and surgical valve replacement, while no study has been performed in the setting of transcatheter aortic valve implantation (TAVI). We aimed to address the incidence, mechanism and impact of blood platelet count decrease following TAVI.

Methods: One hundred forty four consecutive patients (84±7 years old, 64 men) with severe symptomatic aortic stenosis who underwent TAVI between December 2007 and July 2011 were enrolled in the study. Blood platelet count was recorded before and after aortic valve implantation. Blood platelet decrease was compared to in-hospital MACE defined by death, stroke and major or life threatening bleeding.

Results: Blood platelet decrease occurred in all patients but one. The percentage of platelet decrease averaged 34±15% and was 24% greater than blood protein decrease. Decrease in platelet was associated with higher rate of prosthesis migration, longer X-Ray and procedure time and higher contrast amount (230±128 mL for the 3rd tertile vs 170±77 mL for the 2nd tertile, p=0.0006), while no association was observed with changes in bilirubin. In hospital MACE (n=50, 35%) were more observed in patients with severe platelet count decrease (21% for the 1st tertile, 35% for the 2nd tertile, and 48% for the 3rd tertile, p=0.02). Finally, the percentage of blood platelet count decrease was the only predictor of in hospital MACE (38±14% vs 32±16%, p=0.02).

Conclusion: Decline in platelet count is a common phenomenon following TAVI and its severity is associated with worse outcome after TAVI.

Comprehensive geriatric assessment in transcatheter aortic valve implantation patients

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For more than ten years, an alternative therapy for inoperable or high risk symptomatic patients (Pts) with severe aortic stenosis is developed: transcatheter aortic valve implantation (TAVI). However, in elderly Pts optimal management of aortic valve depends on dependence and autonomy improvement. The aim of our study is to evaluate changes in geriatrics autonomy and dependence using specific geriatric scores in Pts undergoing TAVI.

From June 2010 to June 2011, 56 patients (23 males) were prospectively included. Mean age was 84±5 years and mean logistic EuroSCORE was 20.4±2.8%. Valve prosthesis (Edwards Sapien/Sapien XT) was implanted using trans-femoral approach in 44 (79%) and transapical approach in others. Comprehensive geriatric assessment using the following scores was performed before implantation and at 6-month after TAVI: Geriatric Depression Scale (GDS), Mini Mental State Examination (MMSE), Activities of daily Living (ADL), Instrumental Activities of daily Living (IADL), Timed up and go test (TUG), Charlson test, Vulnerability Elders Survey (VES 13).

TAVI was successfully performed in 53 (95%) patients. At 6 month, survival rate was 81% and there was a marked improvement in hemodynamics and symptoms. On echocardiography, mean gradient had decreased from 48±18 to 9±8±0.7 mm Hg, (p<0.01); aortic valve area had increased from 0.7±0.29 cm², (p<0.01) and there was a significant change in New York Heart Association class (p<0.01).

There was no significant changes in autonomy and dependence scores at 6-month for GDS (0.8±1.2 vs 1.3±1.3, p=NS); MMSE (23.7±4.4 vs 22.9±4.2, p=NS); ADL (5.3±1.4 vs 5.3±0.7, p=NS); IADL (5.2±2.2 vs 4.8±2.4, p=NS); TUG (25.3±16.6 vs 26.1±15.8, p=NS).

Only VES 13 had increased (5±0.7 vs 6±4±2.8, p=0.03) indicating vulnerable patients.

Our results demonstrate a marked and significant clinical benefit of TAVI at 6 months without autonomy and dependence impairment in Pts with severe symptomatic aortic valve stenosis.

Severe aortic stenosis at the time of percutaneous Transarterial Aortic Valve Implantation, and new syndromes “normal flow-low gradient” and “paradoxical low flow-low gradient”

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Paradoxical low gradient aortic stenosis is a new entity for which the optimal management approach remains debated. The aim was to show the heterogeneity of practices due to the lack of recommendations concerning the management of patients having a severe aortic stenosis (SAS). In 2012, a survey was conducted in all cardiologists (313) of the “Nord-Pas-de-Calais” region (France). A questionnaire with five brief clinical cases was used to ask proposed management. The exercise test was retained by 52.7% of the practitioners for the asymptomatic SAS. According to guidelines, 91.4% of the cardiologists proposed surgical treatment for the symptomatic SAS. 81.5% of the practitioners performed a stress echocardiography using Dobutamine for patients having a low gradient aortic stenosis with a depressed left ventricular function. Surgical treatment was considered in 58.9% of cases for patients having a paradoxical low flow/low gradient aortic stenosis and in 22.8% of cases for the normal flow/low gradient aortic stenosis. Contrary to normal flow/low gradient, paradoxical low flow/low gradient aortic stenosis was complementary explored in less than one third of cases and proposed examinations were often inappropriate.