Aortic valve is less severely affected in paradoxical low gradient than in high gradient severe aortic stenosis

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Background: Paradoxical low gradient (PLG) severe aortic stenosis (SAS) is a recently described subset of SAS, which is a matter of intense debate. Some authors indeed consider this new entity as a more advanced form of SAS whereas others believe the opposite. To get further insight into the pathophysiology of PLG SAS, we compared the weight of the valves explanted at the time of surgery (AVR) and the degree of valve calcification among consecutive patients with PLG SAS and high-gradient (HG) SAS.

Methods: We prospectively recruited 38 consecutive patients (20 men; mean age: 73 yrs) with isolated non-rheumatic SAS (indexed aortic valve area (AVA)) < 0.6 cm²/m². Prior to AVR, patients underwent multidetector cardiac CT to measure the aortic valve Agatston calcium score. After AVR, the aortic leaflets were weighed on a high precision scale and were subsequently placed into the CT scanner to measure the valve calcium score ex-vivo.

Results: PLG and HG SAS had similar baseline characteristics with the exception of AVAI which was higher (0.44±0.06 vs 0.36±0.10 cm²/m², p=0.008) and MG which was lower (32±7 vs 55±12 mmHg, p=0.001) in PLG than in HG SAS. Analysis of valve specimens demonstrated a high degree of covariance between ex-vivo and in-vivo Agatston scores (r²=0.78) as well as between valve weight and both ex-vivo (r²=0.90) and in-vivo (r²=0.71) Agatston scores. Interestingly, valves explanted from patients with PLG SAS were lighter (1.58±0.65 vs 2.65±1.24g, p=0.001) and showed lower ex-vivo Agatston scores (363±282 vs 1211±840, p=0.001) than HG SAS valves. These differences remained significant after adjustment for gender (p=0.011 for valves weight and p=0.002 for ex-vivo Agatston score).

Conclusion: The valves weight and degree of valve calcification reported in our study indicate that PLG SAS valves are less severely affected than HG SAS valves. These data thus reinforce the hypothesis that PLG SAS is a less advanced form of aortic stenosis than HG SAS.

Outcomes of patients undergoing femoral covered stent graft during percutaneous transcatheter aortic valve implantation

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Although vascular complications are frequent after percutaneous transcatheter aortic valve implantation (TAVI), they can be managed percutaneously most of the time by implanting a covered stent graft in the femoral artery.

Aim: To evaluate the characteristics of patients who required femoral stent implantation after TAVI and to determine the long-term impact of stent placement in the femoral position.

Methods: Between January 2011 and December 2013, 320 patients underwent transfemoral TAVI in our center using the Edwards Sapiens XT valve. After gaining vascular access, a pre-closure technique was performed with a 10-F ProStar XL closure device followed by 16 to 20-F sheath insertion for 23, 26 or 29mm valve implantation. After valve implantation and sheath removal, access site was closed with the ProStar device. An ilio-femoral angiography was performed via the contralateral femoral artery to assess final result and a self-expandable covered stent graft was placed at the level of vessel injury in case of persistent bleeding despite prolonged manual compression or balloon occlusion. Follow-up was performed by phone call and duplex ultrasonography of the access site.

Results: 29 (9%) patients required emergency femoral covered stent graft implantation. Patients characteristics were comparable to those of patients who did not require stent implantation except for previous anticoagulant therapy which was significantly associated with stent implantation (44.8% vs 27.1%, p = 0.045). Despite stent implantation, 2 patients underwent surgery for persistent bleeding. Stent implantation did not affect survival (p=0.456). At a median follow-up of 23 months, only 1 patient complained of groin discomfort impacting his daily life. Neither stent fracture nor occlusion was noted by ultrasonography.

Conclusion: Vascular complications after TAVI can be safely treated percutaneously by femoral covered stent graft with minimal long-term functional impairment and no impact on survival.

Systolic volume index by Doppler echocardiography is a useful marker for stratification and prognostic evaluation in Algerian patients with severe aortic stenosis and preserved ejection fraction

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Introduction and Objectives: The prognosis of patients with severe aortic stenosis, low aortic gradient and preserved ejection fraction is controversial. Our study analyzed the prognosis of these patients and its relation to pressure gradient and aortic valve flow.

Methods: We performed a retrospective cohort study of 268 consecutive patients with severe aortic stenosis and preserved ejection fraction, divided into 4 groups, based on the presence of a systolic volume index greater or lower than 35mL/m2 and the presence of a mean aortic gradient greater or lower than 40 mmHg. Group I: normal flow, high gradient (n=126, 47%); group II: normal flow, low gradient (n=72, 27%); group III: low flow, high gradient (n=40, 15%); and group IV: low flow, low gradient (n=30, 12%). The primary endpoint was overall mortality.

Results: Independent risk factors for mortality were age (hazard ratio=1.06; 95% confidence interval, 1.01-1.08) and atrial fibrillation (hazard ratio=2.19; 95% confidence interval, 1.24-3.94). Surgical treatment was associated with longer survival in all groups (hazard ratio=0.27; 95% confidence interval: 0.13-0.49). Mortality was higher in patients with low flow than in those with normal flow (27.8% vs 13.9%; P=0.004). The most favorable mean prognosis was found in group II (hazard ratio=0.4; 95% confidence interval, 0.2-0.9).

Conclusions: Patients with severe aortic stenosis, normal ejection fraction and low aortic flow have a worse prognosis. Analysis of aortic flow by Doppler echocardiography is useful in risk stratification and therapeutic decision-making in patients with aortic stenosis.

Left bundle branch block after transcatheter aortic valve implantation: incidence, predictive factors and outcome

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Purpose: Conduction disorders are frequent after transcatheter aortic valve implantation (TAVI). The aim of the study was to assess the incidence, the clinical impact and the predictive factors of new-onset left bundle branch block (LBBB) after TAVI.

Methods: Between 2010 and 2014, 198 consecutive patients underwent TAVI in our center and 156 were prospectively followed during 1 year (62 CoreValve (CV), 94 Edwards Sapiens valve (ES)). 42 patients were excluded because of a pre-existing PM before TAVI, death or surgery after TAVI.
**0055**

Pulmonary hypertension and transcatheter aortic valve implantation: prevalence, prognosis impact and evolution

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**Background:** In patients undergoing transcatheter aortic valve implantation, measurement of pulmonary pressure may help to stratify the clinical risk. However, data may lead to patient misclassification and the role of pulmonary vascular resistance which include cardiac output has never been investigated.

**Methods and Results:** One hundred and seventy one consecutive patients with significant symptomatic aortic stenosis (aortic valve area <1 cm² or 0.6 cm²/m²) who prospectively were scheduled for transcatheter aortic valve implantation, underwent preoperative right-sided heart catheterization and quantitative Doppler echocardiography. Of these, 99 (57.9 %) had pulmonary hypertension [invasive mean pulmonary artery pressure (PAP) ≥25 mm Hg] and 40 experienced cardiac events during a 1-year follow-up (readmission for heart failure in 16 patients, sudden and non-cardiac death in 24). In univariate analysis, patients who had cardiac events exhibited a higher both peak systolic PAP (46.9±12.1 versus 40.8±12.0 mm Hg; P = 0.026) and transpulmonary pressure gradient (12.6±4.5 versus 10.1±3.7 mm Hg; P = 0.011), as well as increased pulmonary vascular resistance (PVR; 2.7±1.0 vs. 2.0±0.8 WU; p = 0.002). Peak systolic PAP≥40 mm Hg and PVR>2.05 WU were selected by receiver operating curve for predicting cardiac events with the best sensitivity and specificity. By multivariate Cox regression analysis, independent predictors of cardiac events were as follows: body mass index (P = 0.005), a mitral regurgitation (P = 0.018), and a spectrum of peak systolic PAP≥40 mm Hg with simultaneous PVR>2.05 WU compared with other patients [2.6 (1.39-4.89), p = 0.003].

**Conclusions:** Right heart catheterization could be useful to identify a high-risk subset of aortic stenosis patients candidate for transcatheter aortic valve implantation and help for clinical decision making.

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**0026**

Transfemoral tricuspid valve-in-valve and valve-in-ring implantation using the Edwards SAPIEN XT valve: one-year follow-up


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**Background:** Redo tricuspid surgery may be at high risk or even contraindicated in patients with comorbidities. Transcatheter valve implantation (TVI) has been recently reported in this setting. The aim of this study was to evaluate the early and 1-year outcomes of TVI with Edwards SAPIEN XT valves in failed tricuspid bioprostheses (BP) and ring annuloplasty (RA).

**Methods and Results:** TVI was performed in 6 patients for failed tricuspid surgical valves (3 BP, 3 RA). Median patient age was 58 years, all were in New York Heart Association (NYHA) class III and 5 out of 6 had previously undergone at least 2 cardiac interventions.

The procedure was successful in the 3 patients with BP and 2 with RA; one patient had a moderate paravalvar regurgitation at the level of the open portion of a rigid incomplete ring. Otherwise, regurgitation was absent in 3 patients, trace in 1 and mild in 1. The transvalvular gradient decreased from 8 mmHg at baseline to 4 mmHg at day 7.

At 1-year follow-up, survival was 100%. Tricuspid gradients remained stable in all but 1 patient, as well as regurgitation grades. Only 1 patient was in NYHA class III, 2 were in class II and 3 in class I.

**Conclusions:** Transfemoral TVI with SAPIEN XT valves after failed tricuspid surgery is feasible in selected high-risk patients, with good early and 1-year hemodynamic and clinical results. However, RA may raise issues due to their oval shape and open configuration.