Conclusion: In patients with CAD and inferior wall motion abnormality, MR impacts negatively on exercise capacity and is associated with increased cardiovascular morbidity and mortality. This effect appears independent of degree of LV dysfunction.

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New findings in mitral valve prolapse related to filamin-A mutations


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Objective: Filamin-A (FlnA) is the first identified gene (chromosome X) for non-syndromic mitral valve dystrophy. We aim to assess the overall mitral valve phenotype by echocardiography in male and female patients from a large P637Q FlnA mutation family.

Methods: Thirty-six patients over 10 year old (41±16 years, 12 males) with the P637Q FlnA mutation were matched with 18 control subjects. Six additional patients under 10 year old were also examined.

Results: In male patients both anterior (AL) and posterior (PL) mitral leaflets were elongated (AL: 25.2±3.2 vs 21.6±2.8 mm in controls, p=0.03; PL: 17.8±3.9 vs 12.3±0.9 mm, p=0.001), thickened (leaflet tip: 3.7±1.1 vs 1.8±0.4 mm, p=0.0002) and moderately billowed in the left atrium (AL: –1.1±3.4 vs +3.2±2.2 mm; PL: –2.6±2.5 vs +4.0±2.7 mm, p=0.0005). Anterior and posterior chordal lengths did not differ significantly with controls but both anterior (APM) and posterior (PPM) papillary muscles were positioned closer to the mitral annulus (APM: –1.1±3.4 vs +3.2±2.2 mm; PL: –2.6±2.5 vs +4.0±2.7 mm, p=0.0005). Anterior and posterior chordal lengths did not differ significantly with controls but both anterior (APM) and posterior (PPM) papillary muscles were positioned closer to the mitral annulus as assessed by the mitral annulus-PM distance to the LV long axis length ratio (APM: 27±5 vs 34±4%, P=0.01; PPM: 28±8 vs 34±3%, P=0.03). In female patients lesions were minorsed as expected in an X-linked disease. Mitral annulus enlargement was present only in males. No chordal rupture was seen in any patient. In male and female patients mitral valve dystrophy is unique associating also a doming aspect or restrictive motion, predominant on the posterior leaflet. Finally, mitral valves lesions were also clearly identified in younger patients (3 to 7 year old) particularly in males.

Conclusions: The phenotype of FlnA-related mitral valve dystrophy associates mitral leaflet elongation, thickening and billowing with a moderate diastolic doming aspect or restrictive motion, predominant on the posterior leaflet. Papillary muscle position is displaced closer to the mitral annulus. Mitral lesions are minorsed in females as expected in an X-linked disease.

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Prediction of the left ventricular ejection fraction after surgery of organic mitral regurgitation

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Objectives: This study analyzed the association between pre-operative rest and exercise echocardiography and the 6-month post-operative left ventricular ejection fraction (LVEF) in organic mitral regurgitation (MR).

Background: LV end-systolic diameter is the marker of LV function in patients with organic MR associated to survival and post-operative EF, but still some patients have nowadays a depressed post-operative LV EF despite correct diameters.

Methods: 88 patients (62.6±14 yo) were prospectively recruited. They all got a sub-maximal (to perform a complete echocardiography at rest and at 110±10/min) exercise stress echocardiography before the MR repair and all had an echocardiography at 6-month after-surgery. Exclusion criteria were: coronary artery disease, other organic valvular disease, uncontrolled arrhythmia, hemodynamic instability.

Results: The principal parameters correlated to post-operative LVEF (0.5±0.08) are displayed in table I. using a multivariate linear regression, the global longitudinal strain recorded during the exercise (−20.6±0.5%; p<0.0001), the GLS/LV end-systolic volume (−4.6±0.3; p<0.04) and the left atrial diameter (44.7±0.8 mm; p=0.01) were the best predictor of post-operative LVEF (R²=0.48).

Conclusions: In organic MR, LV end-systolic diameter is a key parameter to propose surgery. We demonstrated that global longitudinal strain (GLS, %) recorded during a sub-maximal exercise and this GLS normalized for the end-systolic volume at rest are, with the LA size, important determinant of post-operative EF.

Table – Main results

<table>
<thead>
<tr>
<th></th>
<th>mean±SE</th>
<th>R (Pearson)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LV end-systolic diameter (mm)</td>
<td>36±0.7</td>
<td>−0.34</td>
<td>0.009</td>
</tr>
<tr>
<td>Left atrial area (cm²)</td>
<td>26.4±1.0</td>
<td>−0.37</td>
<td>0.011</td>
</tr>
<tr>
<td>LV end-diastolic volume (ml)</td>
<td>149.9±5.2</td>
<td>−0.31</td>
<td>0.019</td>
</tr>
<tr>
<td>LV end-systolic volume</td>
<td>52.3±2.5</td>
<td>0.60±5.3</td>
<td>0.003</td>
</tr>
<tr>
<td>Mitral annulus diameter (mm)</td>
<td>37±0.7</td>
<td>−0.25</td>
<td>0.01</td>
</tr>
</tbody>
</table>

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Mitral valve repair: evolution of the “Respect but not Resec” technique: minimally invasive chordoplasty (new technical variant). Experience in 70 patients

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Mitral valve repair is currently evolving. The “respect but not resect” strategy becomes the standard technique with implantation of artificial chordae. Limitation can occur with technical complexity for evaluation of chordae length. The use of surgical and visual criteria allow extension of ability to achieve that ending point.

Surgical procedure is standardized. Minimally invasive video is our routine approach. After assessment of mitral lesions; artificial chordae are inserted in the papillary muscle as much as needed. Then we insert the prosthetic ring to determine the mitral annulus. This will be the referring plane for repair. Third, instead of suturing the free edge of posterior leaflet with chordae and lowering it toward the papillary muscle we lower it to annulus by a double stitch suture. That allows us to modulate with direct viewing the posterior leaflet’s height. This creates a very large coaptation zone which plays a role in long-term results. A video explain the technique.
From November 2007 to April 2011 we performed 170 minimally invasive mitral valve repairs. Among them one of us did perform this modified "respect but not resect" strategy for 70 patients. No resection was needed except for one endocarditis. Perioperative mortality was 0%. None SAM occur during or after procedure. During perioperative period no regurgitation or grade 1 regurgitation were found in 44 patients. Only one had a grade 2 regurgitation at discharge. During follow-up none redo surgery was needed for repair dysfunction, one patient scheduled for endocarditis.

This is a simple and easy procedure to perform, repair of mitral regurgitation is efficient. It is an easy way to evaluate mitral coaptation and avoid SAM without needing external evaluation before weaning bypass. Posterior leaflet is always "smiling" as in Dr Carpentier recommendations. Procedure is safe with good short-term results. Long-term evaluation is still needed.

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Surgery of infective endocarditis analyzed within a one-year population-based study

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Context: Observational studies showed that the rate of valve surgery in infective endocarditis (IE) increased over time and that it may be associated with lower in-hospital mortality.

Objective: To update the description of surgery in IE in France.

Design: Prospective population-based observational study conducted in 2008.

Setting: All medical facilities from 6 French regions representing 32% of the whole French population aged 18 years and older.


Results: 201 patients (40%) were operated on during the active phase of IE: 182 had left-heart (≠ right-heart) surgery, 10 had right-heart only surgery and 9 had surgical lead extraction without valve surgery. Among 398 patients with left-sided (≠ right-sided) IE, 50% had no previously known heart disease, 23% had at least one prosthetic valve. Heart failure was present in 35% and ischemic stroke in 28%. IE was mitral in 45%, aortic in 40% and aortic + mitral in 15%. Echocardiography was performed for IE in 98%. Microorganisms were streptococci in 55% and staphylococci in 30%. Time elapsed between hospital admission and indication for surgery was 10±13 days, it was 15±13 days between hospital admission and surgery. Indication for surgery was hemodynamic in 71% of the patients, infectuous in 40% and prevention of embolism in 54%. Women were operated less often than men (36% vs 49%; p<0.03). As compared to non-operated patients, operated patients were younger (58 vs 67 years; p<0.0001), had more often heart failure (44% vs 28%; p=0.0006), vegetation larger than 10 mm (82% vs 58%; p<0.0001), abscess (39% vs 13%; p<0.0001) and less often mitral IE (33% vs 55%; p=0.0001); distribution of microorganisms was not statistically different; in-hospital mortality was lower (20% vs 26%) but that was not statistically significant.

Conclusion: Surgery is frequently indicated in IE. There is a trend toward lower in-hospital mortality in operated patients.

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One year all-cause mortality after surgical aortic valve replacement and transcatheter aortic valve implantation for the treatment of severe aortic stenosis in high-risk patients: a two-centre study

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Aims: Transcatheter aortic valve implantation (TAVI) is an emerging technique for the treatment of severe aortic stenosis (AS) in high-surgical-risk patients. It is unclear whether it compares favourably with surgical aortic valve replacement (SAVR) in a high-risk non selected population.

Methods and Results: This observational prospective cohort study included all consecutive high-risk patients with severe AS treated by SAVR or by TAVI. Trans femoral (TF-TAVI) approach was the first access option. Trans apical (TA) approach was used if TF access contra-indicated. Co-primary end points were 1 year and 30-day all-cause mortality. Results were described using Valve Academic Research Consortium (VARC) definitions.

143 patients were included: 58 underwent SAVR, 60 TF-TAVI and 25 TA-TAVI. Mean baseline characteristics were the same in the 3 groups except for risk scores and NYHA status, worse for TF- and TA-TAVI patients than for SAVR patients. All-cause mortality in SAVR, TF-TAVI and TA-TAVI groups were respectively 25.9%, 18.3% and 36% at 1 year (p=0.22); and 17%, 5% and 16% at 30 days (TF-TAVI vs SAVR: p=0.034; TA-TAVI vs SAVR: p=0.999).

At 30 days myocardial infarction and major stroke only occurred in SAVR group (7% and 2% respectively). Life-threatening and/or major bleedings were 75% in SAVR group, 53% and 80% in TF and TA-TAVI groups (p=0.016 TF-TAVI vs SAVR, p=0.624 TA-TAVI vs SAVR). Major vascular complications were 8% in TF-TAVI, 2% in the TA-TAVI (p=0.860). 6 peri-procedural deaths of the SAVR group were caused by haemostasis or pericardial draining, 1 year and 30-day NYHA functional status and aortic prostheses mean gradient were the same in the all groups.

Conclusion: This observational study provide a snapshot of the 1 year and 30-day outcome after modern conventional SAVR and TF- or TA-TAVI, in an “real-life” high-risk AS population. It is also probably one of the first studies to describe this outcome using VARC endpoints definitions.

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Invasive assessment of atrioventricular conduction changes following transcatheter aortic valve implantation with self-expandable or balloon-expandable prosthesis

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Background: Atrio-ventricular block (AVB) is one of the complications after transcatheter aortic valve implantation (TAVI), and is more frequent after implantation of a Medtronic CoreValve (MCV) than after implantation of an Edwards Sapien prosthesis (ES).

The aim of this prospective study was to quantify and compare by invasive measurement the exact influence of TAVI with MCV or ES valve on atrioventricular conduction.

Methods: between February 2010 and March 2011, consecutive patients who underwent TAVI with a MCV or an ES valve were included in this prospective, single center study. The His-Ventricle (HV) interval was measured during an electrophysiology study (EPS) before and at least 4 days after the procedure. Patients with pre-existent permanent PM implanted for AVB were excluded.

Results: 60 patients were included. 25 (42%) were treated with a MCV, and 35 (58%) with an ES valve. Mean age was 83±6 years, 62% men with no significant difference of baseline clinical, ECG, echocardiographic data, Logistic EuroScore and STS Score between MCV and ES groups. There was no significant procedural death. HV measurement was feasible in all patients. 19 patients (32%) needed implantation of a permanent PM. Indication was persistent complete AVB in 12 patients (20%) and transient high grade AVB in 4 patients (7%). PM implantation was required in 6 patients (17%) with ES valve and 13 patients (52%) with MCV (Odds Ratio: 6.8, (95% CI 1.9-24.8) p=0.01). HV interval remained stable (increased duration ≤5 ms) in 10 patients (30%) with ES valve and in 5 patients (20%) with MCV (p=0.15). HV interval was prolonged by 10ms or more after procedure in 12 patients (35%) with ES valve and in 17 patients (68%) with MCV (Odds Ratio: 5. (95% CI 1.5-16.9) p<0.01).

Conclusion: This study supports the fact that atraioventricular and particularly infrahisian conductive tissue is frequently impaired after TAVI. This damage is more frequent and more severe with MCV compared with ES valve.