

MULTIVALVULAR HEART DISEASE: WHEN TRANSCATHETER VALVE THERAPY BECOMES A SOLUTION

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HISTORY AND PHYSICAL

61 years-old female patient:

- Rheumatic fever during childhood
- **1977 (26y)**: Atrial fibrillation and mitral valve stenosis -> Mitral valve replacement (Hancock® Bioprosthesis) + Perioperative Pulmonary Embolism
- **1987 (36y)**: severe mitral valve disease, severe tricuspid valve regurgitation and pulmonary hypertension
- **1988 (37y)**: second cardiac surgery
 - Mitral valve replacement (redo) : St Jude® bileaflet mechanical valve
 - Tricuspid valve replacement : Carpentier Edwards® stented bioprosthesis
- **2012 (61y)**: Heart Failure (NYHA IV) - Hospitalized : cardiac evaluation and echocardiography :
 - **Severly stenosed tricuspid bioprosthesis** (mean pressure gradient 12-21 mmHg; peak gradient 18-33 mmHg; significant regurgitation (>2/4); enlarged right atrial)
 - **Moderate aortic stenosis** (mean gradient 24mmHg; peak gradient 43mmHg; valve area 1.1 cm²)
 - Normal left ventricular function
 - Normal mitral valve prosthesis

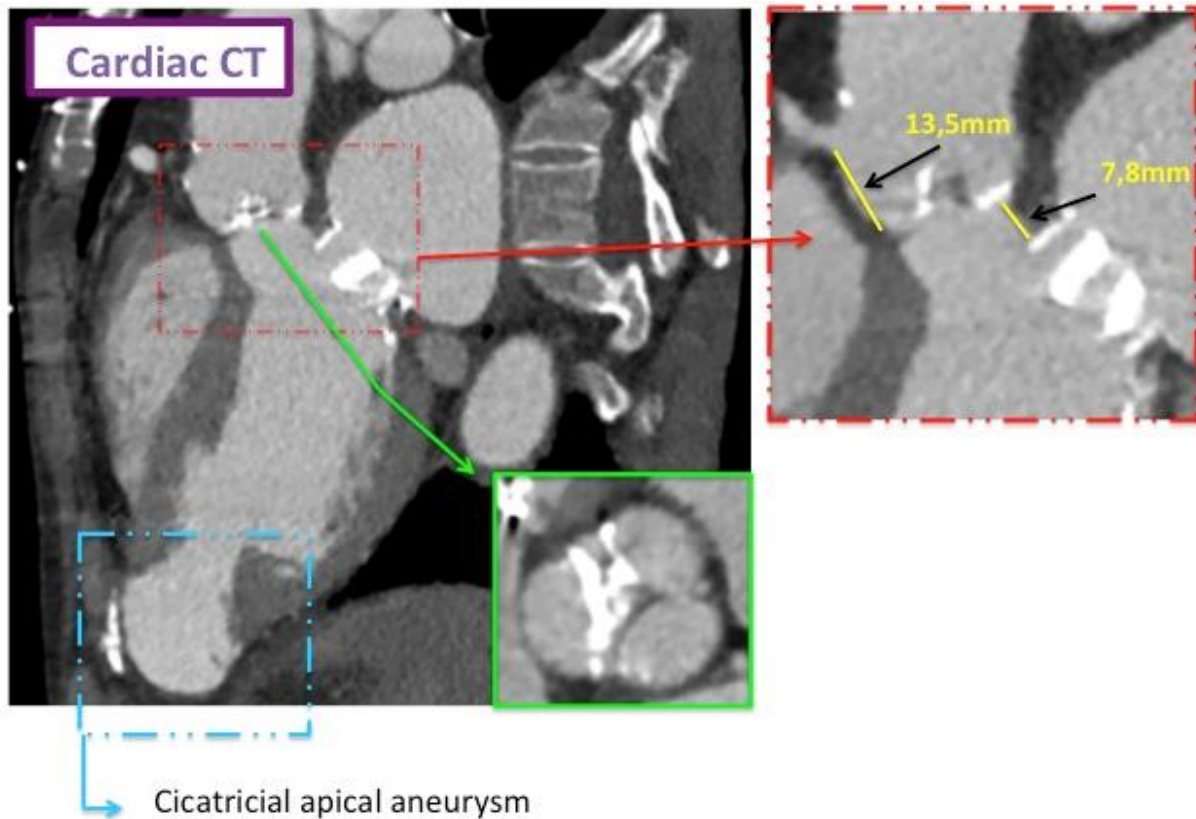
After an aggressive iv diuretic treatment failure and considering the very high (re-)operative risk and patient frailty, we successfully performed a percutaneous tricuspid valve in valve implantation by venous transfemoral access (Edwards Sapien XT 26mm)

-This clinical case has already been presented at PCR London Valves 2012-

However, four years after the procedure , at follow-up in April 2016 (66y):

- Clinical impairment : NYHA FC III-IV. No angina, no syncope.
 - > Severe anemia : Haemoglobin 3.72mmol/L (no acute gastro intestinal bleeding but angiodysplasia - INR 6)
- Echocardiography :
 - **Aortic valve : Severe stenosis** (mean gradient 55mmHg; peak gradient 86mmHg; valve area **0.67 cm²**)
 - Mitral valve : well functioning mechanical valve (mean gradient 7mmHg; peak gradient 14mmHg)
 - Tricuspid valve : Sapien XT with mean residual gradient of 8mmHg

CARDIAC (RE)EVALUATION FOR TAVI AND IMAGING



INDICATION FOR INTERVENTION

Based on Heart Team Decision:

- STS score : 18% ; Euroscore II : 7%
- Normal coronary angiogram
- **TAVI**
 - **Access Choice ?**
 - Transfemoral:
 - denied due to thinnest femoral arteries (<5mm)
 - Transapical /Direct Aortic :
 - not suitable because of severe COPD and calcified LV apex aneurysm
 - Decision for a left trans-carotidian access after assessment of the Circle of Willis by MRI
 - **Valve Choice ?**
 - Aortic Annulus : mean diameter 23.2mm, area : 424mm²
 - Edwards® Sapien S3 # 26mm

INTERVENTION

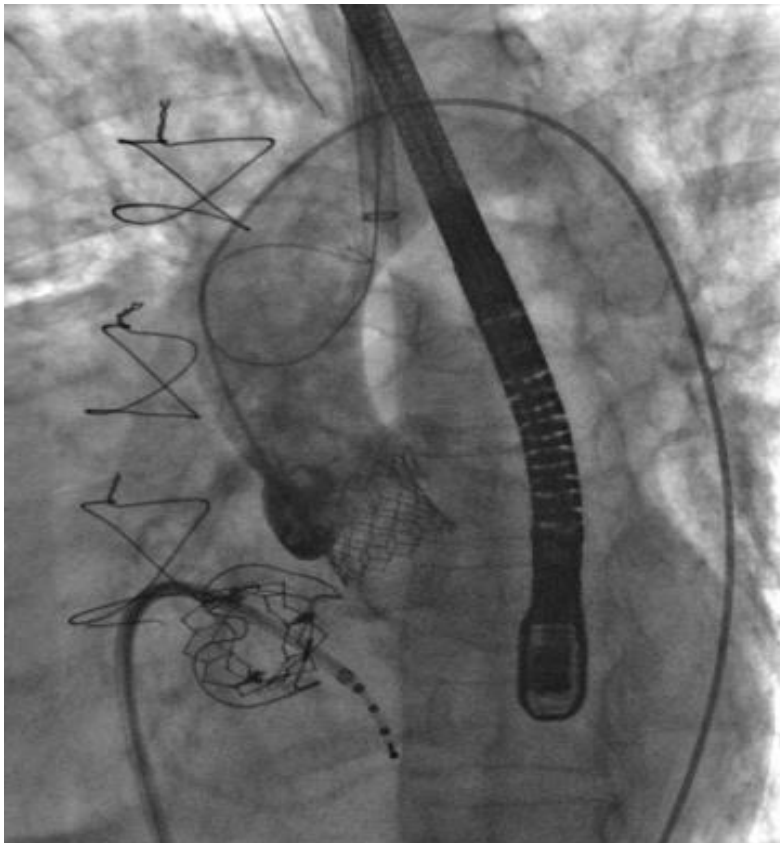
The Key points for the procedure were :

- An enlarged RA / RV pacing lead
- A short distance between coronary ostia and prosthetic mechanical mitral valve frame to insert Sapien 3 in aortic position; the height of Sapien 3 when fully expanded is 20mm
- Carotid artery diameter (mean : 5.5 mm)
- Certitude delivery system with the valve mounted upside-down

The procedure required :

- General anesthesia
- Right femoral vein access for RV pacing lead (through the tricuspid Sapien XT)
- Right femoral artery for aortography (Pigtail)
- Surgical cutdown for left carotid artery

- Aortic valve : pre-dilatation with balloon 23mm
- Edwards® Sapien S3 #26 mm
- Edwards® Certitude delivery system



FOLLOW-UP

January 2017 :

- Clinical Status : NYHA FC I-II, no rehospitalization
- Echocardiography:
 - Tricuspid bioprosthesis /Sapien XT : FU at 5 years
 - No significant changes in gradients since 2012 post procedure (mean gradient 5mmHg)
 - Reduction of the right atrial volume (from 1300ml in 2012 versus 866ml in 2017)
 - Aortic Valve (Sapien 3) : FU at 6 months
 - Mean gradient 7mmHg; peak gradient 13mmHg
 - Valve area: 1.58 cm², no paravalvular leak

LEARNING POINTS OF THE PROCEDURE

- Percutaneous valve in valve for tricuspid bioprosthesis stenosis (2012) : follow-up at 5 years
- TAVI through transcatheter access (2016) : safe and feasible alternative
- Uneventful clinical outcome (up to 1/2017)

Finally :

- Transcatheter valve therapies can offer new treatment options for patients with multivalvular heart disease
- A careful preprocedural evaluation is required as well as a multidisciplinary approach