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ALDERETE, JUAN R; ANAYA REVOLLEDO, ALBERTO C; VOLBERG, VERÓNICA I; RUBIO, MIGUEL; BARRERA, GUSTAVO E; BERENSZTEIN, SARA

Tratamiento percutáneo de la disfunción valvular protésica en posición mitral: *valve-in-valve* mitral por vía transapical

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Table. Cardiovascular risk factors and morbidities of included patients. CHD: coronary heart disease. AF: atrial fibrillation. CKD: chronic kidney disease. TIA: Transient ischemic attack.

Characteristics	Total sample (N = 3,168)	1st Quartile (n=850)	2nd Quartile (n=766)	3rd Quartile (n=754)	4th Quartile (n=798)
Male, n (%)	1287 (40.6)	295 (34.7)	327 (42.7)	345 (45.8)	320 (40.1)
Age (years), mean ± SD	54 ± 18	32 ± 6	48 ± 4	61 ± 4	78 ± 8
Weight (kg), mean ± SD	74 ± 17.4	72.5 ± 19.7	77 ± 17.8	77 ± 16.3	69.7 ± 14.1
Height (cm), mean ± SD	162.1 ± 10.1	164.4 ± 9.5	164.3 ± 9.8	162.5 ± 9.7	157.3 ± 9.7
BMI (Kg/m2), mean ± SD	28 ± 5.4	26.6 ± 5.8	28.4 ± 5.2	29.1 ± 5.2	28.1 ± 4.9
Abdominal circumference, mean ± SD	91.6 ± 14.2	86 ± 15.1	91.9 ± 14.2	94.8 ± 13.4	94.2 ± 11.9
Abdominal obesity, n (%)	2072 (65.4)	390 (45.9)	499 (65.1)	575 (76.3)	608 (76.2)
Hypertension, n (%)	1221 (38.5)	110 (12.9)	211 (27.5)	354 (46.9)	546 (68.4)
Diabetes, n (%)	283 (8.9)	12 (1.4)	38 (5)	96 (12.7)	137 (17.2)
Dyslipidemia, n (%)	884 (27.9)	93 (10.9)	187 (24.4)	279 (37)	325 (40.7)
Heart failure, n (%)	73 (2.3)	3 (0.4)	3 (0.4)	11 (1.5)	56 (7)
CHD, n (%)	160 (5.1)	7 (0.8)	11 (1.4)	36 (4.8)	106 (13.3)
AF, n (%)	54 (1.7)	3 (0.4)	3 (0.4)	12 (1.6)	36 (4.5)
CKD, n (%)	143 (4.5)	3 (0.4)	11 (1.4)	28 (3.7)	101 (12.7)
Stroke/TIA, n (%)	27 (0.9)	0	0	6 (0.8)	21 (2.6)
Smoking, n (%)	233 (7.4)	40 (4.7)	40 (5.2)	78 (10.3)	75 (9.4)
Alcohol, n (%)	67 (2.1)	23 (2.7)	15 (2)	13 (1.7)	16 (2)
Poor diet, n (%)	250 (7.9)	38 (4.5)	63 (8.2)	74 (9.8)	75 (9.4)
Sedentarism, n (%)	339 (10.7)	60 (7.1)	80 (10.4)	92 (12.2)	107 (13.4)

To our knowledge, this is the first study in ambulatory patients of Guayaquil, Ecuador, that aims to describe cardiovascular health status in adults. The main strength of this research is the long term follow-up and sample size. The main limitations are its retrospective design and selection bias derived for using data from one single center.

In conclusion, cardiovascular health still needs to be improved in adults of Ecuador in order to decrease the cardiovascular disease burden.

Conflicts of interest

None declared.

(See authors' conflicts of interest forms on the website/ Supplementary material).

Patricia Delgado[1], Patricia Vargas[1], Cristina Vargas[1], Aldo F. Costa[2]

[1] Instituto Ecuatoriano del Corazón (IECOR), Guayaquil - Ecuador
[2] Universidad de Especialidades Espíritu Santo, Guayaquil - Ecuador
Email: pdelgadodevargas@gmail.com

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Percutaneous Management of Prosthetic Valve Dysfunction in Mitral Position: Transapical Mitral Valve-In-Valve Implantation

Resolution of mitral valve dysfunction has been an important issue in cardiac surgery for many years. The mitral valve complex is altered by several conditions that involve the leaflets, the annulus and the papillary muscles. Medical advances have decreased rheumatic causes and degenerative ones are now predominant, particularly in developed countries.

Since the 1960's, mechanical and biological valve prostheses and various mitral valve repair techniques have been developed. Nowadays, with the significant advances in cardiovascular medicine, indications have extended and widened the universe of treated patients, resulting in considerable life extension, (1) as very few patients with severe MR (mitral regurgitation) survive in the long-term without intervention. (2)

The transfemoral implantation of an aortic valve made by Cribier in 2002 and the first transapical mitral valve-in-valve implantation made by Cheung in 2009 (3) are two samples of creativity in interventional cardiology to solve a key cardiac issue, avoiding the use of extracorporeal circulation and wide chest opening.

This technique has been used mainly with bioprosthetic valves in aortic position, not so commonly in mitral position, and even less in the tricuspid valve. (4) Techniques that require an intense learning phase can achieve better results in high-volume, high-experienced hospitals. (5) Moreover, heart valve centers should have structured training programs. (4)

The purpose of this presentation is to introduce the first transapical mitral valve-in-valve implantation in Argentina. We describe the case of an 83-year old woman with previous myocardial infarction in 2008. She underwent combined surgery in 2009 with biological mitral valve number 25 (biological porcine valve HVP) implantation together with aorto-coronary venous bypass to the anterior descending aorta, and aorto-coronary venous bypass to the lateral ventricular circumflex artery. The patient suffered from chronic atrial fibrillation under anticoagulation therapy and chronic renal failure with creatinine clearance of 32 mL/min.

She also had functional class II dyspnea, which had progressed to functional class III in the last few months. Transthoracic echocardiography (TTE) showed severe mitral regurgitation with eccentric jet with Coanda effect to the atrial roof, and marked collapse of both leaflets. She had severe tricuspid regurgitation with pulmonary artery systolic pressure (PASP) of 75 mmHg, mild to moderate left ventricular systolic function (LVSF) with ejection fraction (EF) of 50% and inferior, inferolateral, and septal akinesia. The coronary angiography showed moderate lesion in the left main coronary artery, severe lesion in the anterior descending artery and in the circumflex artery, and total occlusion of the right coronary artery; both venous bypasses were occluded. The case was discussed in the clinical-surgical seminar of the Department of Cardiology, in which it was decided to perform a percutaneous valve-in-valve implantation in mitral position, and to include the patient in the institutional structural heart disease program.

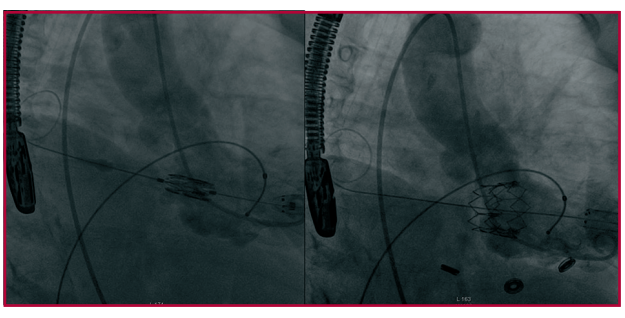

Fig. 1. Fluoroscopy with SAPIEN XT valve in mitral position before deployment (left) and after deployment (right).

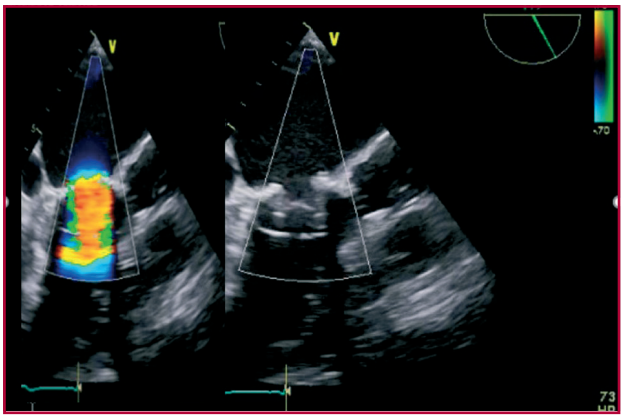

Fig. 2. SAPIEN XT valve in mitral position; evaluation with transesophageal echocardiography with Doppler (left) and without Doppler (right).

The intervention was performed under general anesthesia, and supported by transesophageal echocardiography (TEE), ruling out the presence of thrombus. A minithoracotomy at the level of the fifth/sixth left anterior intercostal space was performed, followed by pericardial opening maintained with two stitches with triangular concentric prolene 3-0 sutures. A direct puncture of the apex was performed, and a soft guidewire was advanced and exchanged for a 0.035" ExtraStiff guidewire in the left atrium. The procedure was confirmed mainly with TEE, since the implanted biological valve did not provide radiolucent edges as guidance for correct positioning. (6). Proper position of the Edwards SAPIEN XT balloon-expandable valve number 26 (Figure 1) was done indirectly via a pig tail catheter in the left ventricle, and through rapid pacing at 180 beats per minute; the balloon was expanded and the valve was deployed. The procedure was successfully completed after assessing correct valve functioning monitored by radioscopy, MUGA scan, and TEE, with absence of paravalvular leaks (Figure 2). The patient was transferred to the coronary care unit, and was discharged 4 days after surgery without complications.

Follow-up TTE prior to discharge and one-month post-intervention showed normal functioning of the prosthesis with adequate gradients.

Postoperative and 1-month clinical follow-up revealed evident clinical improvement in functional class I. The TTE performed 5 months afterwards revealed slightly depressed left ventricular systolic function with EF of 48%, lateral and inferolateral akinesia, preserved right ventricular size and slightly depressed function with TAPSE (tricuspid annular plane systolic excursion) of 17, moderate left atrial enlargement, normal function of the mitral valve prosthesis, moderate tricuspid valve regurgitation with 60 mmHg PASP, sinus rhythm in all controls, and functional class I.

Transapical mitral valve-in-valve implantation is an effective and safe procedure in high-risk patients in whom surgery is contraindicated. The current approach, with almost no restrictions on indications, confronts us with a large number of patients who represent a great challenge for their treatment due to age, comorbidities, ventricular and prosthetic dysfunction, etc. Risk scores greatly contribute to the indications and restrictions of surgical procedures. This may determine an extreme limit and discourage a conventional surgical procedure, as in the case described.

The purpose of our presentation was to demonstrate that this procedure is feasible in our context, and our outcomes are of high medical quality.

Mid- and long-term follow-up of patients undergoing this technique is necessary, although the initial evidence shows a favorable and encouraging panorama in this type of patients.

Current experience with percutaneous mitral valve replacement techniques is very scarce, and surgical mitral valve repair techniques have demonstrated a higher benefit over valve replacement, in part due to the preservation of the chordae tendineae and papillary muscles. (6)

With the advent of new bioprostheses, percutaneous mitral valve replacement will have an exponential growth; after the initial stage of the first experiences, feasibility and safety of these valves will have to be demonstrated and supported by randomized studies to determine their prognostic value in the treatment of mitral valve disease.

The development of minimally invasive procedures requires state-of-the-art technology, since it is impossible to develop this type of program without excellent resources. We are certain these procedures will be progressively used by all health centers in Argentina.

Conflicts of interest

None declared.

(See authors' conflicts of interest forms on the website/ Supplementary material).

Juan R. Alderete[1, 2], Alberto C. Anaya Revolledo[1, 2], Verónica I. Volberg[2], Miguel Rubio[3], Gustavo E. Barrera[1, 2], Sara Berensztein[2]

1 Catheterization Laboratoriy. Hospital de Clínicas José de San Martín
2 Department of Cardiology. Hospital de Clínicas José de San Martín
3 Department of Cardiovascular Surgery. Hospital de Clínicas José de San Martín

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Refractory Neonatal Atrial Flutter

Atrial flutter (AFl) is a rare tachyarrhythmia that may occur in utero or on the first few days after birth, with a frequency of atrial contraction (saw-tooth P waves) ranging from 280 to 450 beats per minute (bpm). It accounts for about 32% of all neonatal arrhythmias and it may be asymptomatic or present with severe heart failure. Both the immature myocardium and the high pressures in the right atrium during the perinatal period are factors that may promote atrial re-entry, causing flutter in the fetus or the neonate. In general, AFl is not associated with structural heart disease, and treatment should consider the use of antiarrhythmic drugs or synchronized cardioversion. (1-3)

We describe the case of a full-term male neonate, large for his gestational age (3875 g), delivered by a 27-year-old multigravida woman, born by emergency C-section due to fetal tachycardia diagnosed hours before delivery. On admission to the NICU, the baby presented with a heart rate (HR) of 214 bpm. ECG showed saw-tooth P waves suggestive of AFl with a 2:1 conduction pattern (atrial frequency: 375 bpm, ventricular frequency: 214 bpm). Chest X-ray revealed cardiomegaly (Figure 1A & B), and echocardiography reported systolic dysfunction (EF: 58%), with no structural heart disease. The patient was started on intravenous amiodarone (loading dose: 5 mg/kg), and then in continuous infusion (5 ug/kg/min) for 12 hours with no positive response, so the amiodarone dose was increased to 10 ug/kg/min. A second ECG reported no variations, therefore cardioversion at 1 joule/kg was performed on two continuous occasions (2-min interval) and sinus rhythm was achieved (Figure 2). Amiodarone infusion was administered for three more days, and then propranolol therapy was started (2 mg/kg/day). A new echocardiography reported mild pulmonary hypertension (36 mmHg) and thus sildenafil was added (4 mg/kg/day). Serology was negative for HIV, VDRL, and TORCH. Thirteen days after birth, the patient remained with sinus rhythm and normal