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Transcatheter aortic valve migration in aortic regurgitation following left ventricular assist device

Migración de prótesis aórtica transcatéter en insuficiencia aórtica por asistencia ventricular

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To the Editor,

Moderate-to-severe aortic regurgitation (AR) is a common complication of patients treated with continuous-flow left ventricular assist devices (CF-LVAD) that affects 35% of these patients at 5 years.[1] The risk factors associated with its appearance are the absence of valvular opening, the time of progression, the presence of aortic or mitral regurgitation prior to implantation, and female sex.[2] AR causes left ventricular overload and inefficient recirculation flow through the pump. Observational studies have reported that post-implantation AR is not associated with a higher mortality rate. However, it has been reported that the cardiac function deteriorates requiring some type of procedure in 33% of the patients who develop it.[3]

The implantation of percutaneous devices, in particular transcatheter aortic valve implantation (TAVI), has become the therapeutic alternative in this subgroup of patients in whom surgery is ill-advised because of their risk and possible future procedures.[4] Although evidence is scarce on this regard, it has been described as an effective technique with disappearance of significant AR after the procedure and in the mid-term follow-up.[5]

This is the case of a 54-year-old woman with idiopathic dilated cardiomyopathy in situation of advanced heart failure who received the Heartmate III CF-LVAD (Abbot, Chicago, United States) as the destination therapy. The transthoracic echocardiogram performed prior to implantation showed severe ventricular dysfunction, a non-dysfunctional right ventricle, mild AR, and moderate mitral regurgitation. Five months after the implant the patient was admitted due to heart failure. The new echocardiogram performed revealed the lack of aortic valve opening with leaflets without relevant morphologic abnormalities but with reduced mobility when closing, and severe systolic-diastolic AR (figure 1A). Although the ramp test performed with right heart catheterization showed fewer revolutions, the patient remained seriously symptomatic with persistent AR, which is why TAVI was decided in a multidisciplinary session. The computed tomography performed revealed the presence of a noncalcified aortic valve with a 25 mm × 21 mm annulus, a 73 mm perimeter, and 26 mm × 27 mm sinus

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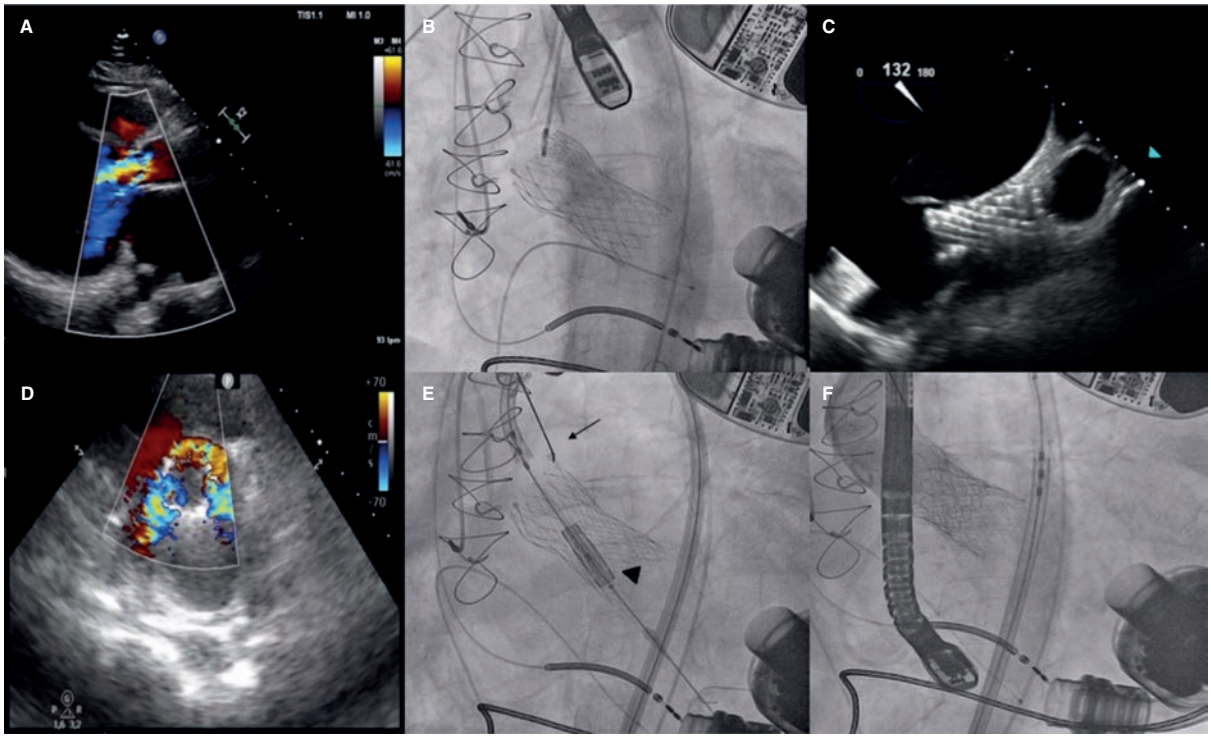

Figure 1. A: transthoracic echocardiogram prior to the implant. Continuous severe aortic regurgitation. **B:** aortic angiography. Early results after Evolut R 26 mm valve implantation. **C:** transesophageal echocardiogram after the implant. Valve migration towards the left ventricle. **D:** transesophageal echocardiogram after the implant. Severe aortic regurgitation. **E:** fluoroscopy. Repositioning of the Evolut R 26 mm valve using snare catheter system (arrow). Edwards SAPIEN 3 23 mm valve advanced for valve-in-valve implantation (arrowhead). **F:** aortic angiography. Valve-in-valve implantation final result.

parameters. The Evolut R 26 mm system (Medtronic, Minneapolis, United States) was used following technical advice and given the dimensions of the root at sinus level. Informed consent to publish was granted verbally.

The procedure was performed via femoral access. Assist only stopped during implantation to avoid suction effect. The early results were satisfactory, and the valve remained in a normal position with mild paravalvular AR (figure 1B).

In the early progression, the patient developed cardiogenic shock, and required vasoactive drugs at high doses. The transesophageal echocardiogram confirmed the apical displacement of the valve with severe paravalvular regurgitation (figure 1C,D). Under this situation, it was decided to perform an emergent valve-in-valve implantation procedure . Using the radial access, a snare catheter was advanced in order to capture the Evolute valve and traction it until it would be placed it in its early location. Afterwards, an Edwards SAPIEN 3 23 mm valve (Edwards Lifesciences, Irvine, United States) was implanted via femoral access and the valve-in-valve procedure was performed with 2 mL inflation volume above nominal value (figure 1E,F). The transesophageal echocardiogram performed after the implant revealed the presence of mild paravalvular AR. The patient's clinical progression was good and uneventful. Eighteen months later the good results still remain with mild paravalvular AR. The patient is now a New York Heart Association functional class II patient.

TAVI in patients with AR and CF-LVAD is a procedure with characteristics that are especially risky. Together with paravalvular leak, the migration of the device is the main complication of this technique. It is a classic complication of TAVI in the management of pure AR where there is fewer calcification and valve anchoring is more complicated. And all of it adds to the apical suction of the pump.

In order to prevent migration, it has been suggested to oversize the valve in relation to the annulus (15% to 20% for balloon-expandable valves and 20% to 25% for self-expandable valves), and use recapturable self-expandable systems[6] to allow a more controlled release and reduce the revolutions of the device during implantation. In our case, oversizing was discarded due to the presence of a small aortic root with the corresponding risk of rupture.

In conclusion, TAVI for the management of patients with AR and CF-LVAD is an effective procedure with good mid-term results. The peculiarities of this context require careful planning and implantation to reduce complications such as valvular migration. The recapture of the valve and valve-in-valve implantation are effective techniques to solve this complication and avoid surgery.

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Effects of the COVID-19 pandemic on the population over 75 years old with coronary artery disease. The EPIC SIERRA 75 registry

Efectos de la pandemia de COVID-19 en la población mayor de 75 años con enfermedad coronaria. Registro EPIC SIERRA 75

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To the Editor,

The negative impact of the SARS-CoV-2 pandemic on public health is due not only to the infection itself, but also to the effects of confinement and the negative impact of the population's perceptions on the risks involved when visiting medical facilities for health reasons. Proof of this are the repeated observations of an obvious reduction in the number of patients treated of myocardial infarctions during the pandemic.[1,2] It is highly plausible that what we saw with ischemic heart disease happened with other conditions as well whether cardiovascular or not.

It is well known that older populations and patients with vascular risk factors and/or cardiovascular disease have been the ones most severely affected by the pandemic.[3]

In this study we evaluated the impact of the pandemic on the population of patients over 75 years of age with known coronary artery disease. For this purpose, a subgroup of all the patients recruited in the ongoing prospective EPIC SIERRA 75 registry published at ClinicalTrials.gov (identifier: NCT03567733) were included in this study. The EPIC SIERRA 75 is a prospective registry that included patients over 75 years with percutaneous revascularization of de novo coronary artery lesions using a new-generation drug-eluting stent. Those with cardiogenic shock or whose life expectancy was < 1 year were excluded from the study. Recruitment started back in June 2018 in 35 Spanish hospitals and 7 Portuguese centers.

For the purpose of the present study, a subgroup of patients registered in the EPIC SIERRA 75 study from 24 hospitals were selected. The follow-up was updated and it covered the entire official 2-month period of confinement through direct phone calls with the patients and/or their relatives who answered a specifically designed questionnaire. Additionally, all electronic health records available in corresponding hospital units have been reviewed. The EPIC SIERRA 75 registry received the approval of each of the clinical research ethics committees of the participating centers. All patients granted informed consent prior to their inclusion in the registry.

A total of 709 patients who underwent a percutaneous coronary intervention within the 18 months prior to the pandemic were included. A total of 17 of these patients died during the 12.5 months ± 3.4 months of median follow-up prior to confinement. This means that 692 patients were followed during the outbreak period. The patients' clinical characteristics are shown on table 1.

During this period, 11 (1.6%) confirmed cases of COVID-19 have been reported. Therefore, the incidence of COVID-19 was higher compared to that of the general population during such period (1.6% vs 0.4%).[4] This incidence varies across different regions in Spain, meaning that this comparison could be affected by the territorial distribution of the patients.

These patients were 81.2 ± 5 years old and 36.3% were females (P = .6 and P = .9 compared to the rest of the patients, respectively). Two patients (18%) died at the hospital, an 80-year-old man and a

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