## Circulatory Support and Extracorporeal Membrane Oxygenation in Transcatheter Aortic Valve Implantation

Severe aortic stenosis (SAS) is the most common valve disease in elderly patients. As many of these patients have several comorbidities and high risk for conventional surgery, transcatheter aortic valve implantation (TAVI) has been developed as an option. (1)

While TAVI is a proven and safe procedure, it presents risks associated with technical aspects, which are difficult or impossible to anticipate (vascular or ventricular trauma), and others that are specific to the patient, some of which can be prevented in order to avoid an unfavorable prognostic impact. (2)

An 82-year-old diabetic patient with SAS, ejection fraction of 15%, and history of aortic valve replacement, was hospitalized for heart failure, requiring inotropic support and mechanical ventilation, with prohibitive risk for conventional surgery (EuroSCORE II 70.5%). The case led to surgical team consensus of using TAVI as therapeutic approach. Due to the preoperative condition and the high chance of hemodynamic intolerance during the procedure, a circulatory support device (extracorporeal membrane oxygenation, ECMO) was used.

Arterio-venous cannulation of the femoral vessels (with 21F venous cannula and 17F arterial cannula (MAQUET AG, Hechingen, Germany) was performed. A Sapien prosthesis (Edwards Sapien XT, Edwards Lifescience, Irvine, Ca) was implanted. As during the procedure, the patient developed extreme bradycardia and deep cardiogenic shock, circulatory support with ECMO (CardioHelp®, MAQUET, Hechingen, Germany) was provided. This allowed the procedure to be completed successfully (Images A and B) and the patient was transferred to ICU under drug and respiratory support.

Once the echocardiography revealed myocardial functional recovery, the device and the drug and respiratory support were successively weaned, a process demanding 96 hours. Several case reports such as the present one, together with two clinical series, pose the usefulness of this strategy in selected patients. Husser et al. reported 18 cases of prophylactic use of ECMO, which represent 8% of total TAVI performed with 97% implant success and 7% mortality at 30 days, while Seco et al. performed 11 ECMO in 100 TAVI patients, with one death (9%). (3, 4)

Stretch et al. reported an increase in the use of mechanical circulatory support in patients over 80 years of age, which rose from 6.2% between 2004 and 2007 to 11.9% between 2008 and 2011. The question is whether the lack of mechanical circulatory support availability could become ethically unacceptable, and even legally controversial, given the increasing growth of TAVI procedures. (5, 6) The indications for prophylactic use of ECMO during TAVI include severe ventricular function impairment, pacemaker intolerance

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### Table 1. Baseline characteristics of OR vs. SOR patients

<table>
<thead>
<tr>
<th></th>
<th>OR</th>
<th>SOR</th>
<th>Odds ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 197</td>
<td>180 (91.37%)</td>
<td>17 (8.62%)</td>
<td>-</td>
<td>0.794</td>
</tr>
<tr>
<td>Age 70 years</td>
<td>36</td>
<td>5</td>
<td>1.62</td>
<td>0.360</td>
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<tr>
<td>Male sex</td>
<td>137</td>
<td>12</td>
<td>1.33</td>
<td>0.567</td>
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<tr>
<td>Diabetes</td>
<td>26</td>
<td>6</td>
<td>3.21</td>
<td>0.026</td>
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<tr>
<td>Smoking</td>
<td>76</td>
<td>4</td>
<td>2.37; 0.196</td>
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<tr>
<td>Hypertension</td>
<td>105</td>
<td>12</td>
<td>1.69; 0.441</td>
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<tr>
<td>Prior myocardial infarction</td>
<td>14</td>
<td>4</td>
<td>3.60; 0.056</td>
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<tr>
<td>KK 3/4 on admission</td>
<td>10</td>
<td>2</td>
<td>2.26; 0.280</td>
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<tr>
<td>Prior revascularization</td>
<td>12</td>
<td>5</td>
<td>5.76; 0.008</td>
<td></td>
</tr>
</tbody>
</table>

**REFERENCES**

6. Roule V, Thibaut H, Andrien L et al. Acute Cardiopulmonary Care, Residual platelet reactivity after pre treatment with Ticagrelor prior to PTCA, associated with SMR. EHJ 1-7 2019

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**Table 1.** Baseline characteristics of OR vs. SOR patients
prior to implantation, and hemodynamic instability prior to or during induction of anesthesia and the concomitant angioplasty of the main coronary artery, to prevent severe complications that could compromise the success of the procedure and patient survival. The feasibility of this strategy has been demonstrated in selected cases. (3-5)

Conflicts of interest
None declared.

(Ethical approval
Not applicable.

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REFERENCES

Virtual Cardiology Outpatient Clinic in a Public Hospital During the COVID-19 Pandemic

The COVID-19 pandemic has generated health measures such as interruption of in-person work activities, social confinement, and suspension of scheduled medical services. (1, 2) “Hospital El Cruce - Néstor Kirchner” is a high-complexity tertiary care center that is part of a public health network in the south of the Greater Buenos Aires Area.

A system of referral and counter-referral of patients operates through the network, so that most patients return to their referring institutions after hospitalization or diagnostic-therapeutic interventions. A lower proportion of patients are followed-up by hospital physicians, due to complex diseases that may require additional procedures or rehospitalizations.

Thus, outpatient clinics receive a reduced number of patients depending on the hospital services provided, with scheduled appointments and full schedules for several months. As of March 20, with the provision of the pandemic lockdown by national authorities, the hospital’s outpatient clinic was interrupted. (2)

In the first week of April, we started a telephone follow-up program for patients with scheduled appointments, which was then followed by a system designed for patients who had smartphones or computers suitable for that practice. (3-5) The Department of Telemedicine created a virtual consultation procedure within the current regulatory framework (Resolution 2018-189-APN-SGS#MSYDS / DI-2019-1-APN-DNSIS#MSYDS), adapted to the mandatory,