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# First Two Brazilian Cases: Correction of Ascending Aortic Aneurysm and Aortic Valve Stenosis with Sutureless/Rapid Deployment Aortic Prosthesis

Isaac Azevedo Silva<sup>1</sup>, MD, PhD; Ricardo Barros Corso<sup>1</sup>, MD; Marcus Vinicius Nascimento Santos<sup>1</sup>, MD; Helmgton José Brito de Souza<sup>1</sup>, MD, PhD; Glauco K. S. Pina<sup>1</sup>, MD

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## Abstract

Ascending aortic aneurysm is usually associated with aortic valve diseases, especially aortic stenosis. The standard technique involves the substitution of the dilated aortic segment with a Dacron tube and replacement of the aortic valve with a regular prosthesis. The correction of ascending aortic aneurysm with

aortic valve replacement using the new sutureless and rapid deployment prosthesis was performed by a minimally invasive approach and for the first time in a Brazilian Center.

**Keywords:** Aortic Valve - Surgery. Heart Valve Prosthesis. Treatment Outcome.

## INTRODUCTION

The association between aortic valve dysfunction and dilatation of the ascending aorta is well known<sup>[1]</sup> and the treatment usually involves the aortic valve replacement with substitution of the dilated aortic segment. Sometimes, a total ascending aortic segment needs to be treated in addition of a valve replacement, (Bentall De Bono) but an aortic-root-sparing approach may be feasible when there is no sinus dilatation<sup>[2]</sup>. In this new era of sutureless and rapid deployment prosthesis, a root-sparing ascending aortic replacement with modern prosthesis has been described with good results<sup>[3]</sup>. Here, we describe our initial two cases, for the first time performed in Brazil.

## CASE REPORT

### Case 1

A 62-year-old male patient, with no history of comorbidities, presented with functional capacity reduction and complained of dyspnea on greater efforts of progressive worsening. Coronary angiography showed no obstructive lesions in coronary arteries.

Echocardiogram: EF 73%; Left atrium 37ml/m<sup>2</sup>; Aortic valve area 1.0cm<sup>2</sup>; maximum gradient 81 mmHg and medium gradient 51 mmHg; Pulmonary artery systolic pressure 33 mmHg; mitral valve without abnormalities.

Angiotomography: root 35mm; tubular thread ascending 47mm; arch 42mm; isthmus 25mm; descending 22mm.

He was submitted to an aortic valve replacement + replacement of the ascending aorta by the minimally invasive technique (mini-sternotomy in J). Briefly, under cardiopulmonary bypass, the distal ascending aorta was cross clamped. After anterior oblique aortotomy, a calcified and stenotic tricuspid aortic valve was found. Del Nido cardioplegia was delivered directly in coronary ostia. Resection of the entire dilated aortic segment was performed and a Dacron™ tube number 34 was sutured above the coronary ostia and a biological sutureless aortic valve (Perceval™ XL LivaNova) was implanted. Cross clamp time: 81 min. Total cardiopulmonary bypass time was 95 min.


Intraoperative transesophageal echocardiogram demonstrated normofunction of the valvular prosthesis, no paravalvular leak and a mean gradient of 3 mmHg.

<sup>1</sup>Cardiovascular Associados, Brasília, DF, Brazil.

This study was carried out at the Cardiovascular Associados, Brasília, DF, Brazil.

Correspondence Address:

**Isaac Azevedo Silva**

 <https://orcid.org/0000-0003-1869-6272>

Cardiovascular Associados

Seps 709/909 - Bloco A, Sala T04 - Brasília, DF, Brazil

Zip Code: 70390-095

E-mail: isaacazevedo@yahoo.com

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## Case 2

A 61-year-old male patient, with a history of hypertension and a long-term heart murmur accompanied of recent onset of dizziness and dyspnea. Echocardiogram showed severe aortic stenosis and ascending aortic aneurysm. Angiotomography showed ascending aorta with 48 mm diameter. Coronary cardiac catheterization with irregularities and severe aortic stenosis, with a systolic gradient of 80 mmHg.

He was submitted to aortic valve replacement + replacement of the ascending aorta by the minimally invasive technique (ministernotomy in J). Under cardiopulmonary bypass an anterior oblique aortotomy was performed. A type 1 bicuspid aortic valve was found, full of calcium and very stenotic. Del Nido cardioplegia was delivered directly in coronary ostia. Resection of the entire dilated aortic segment was performed and a Dacron tube number 32 was sutured above the coronary ostia and a biological rapid deployment valve (Intuity™ 25 Edwards) was implanted. Cross clamp time: 80 min. Total cardiopulmonary bypass time was 96 min.

Intraoperative transesophageal echocardiogram demonstrated preserved biventricular function, well positioned prosthesis, no paravalvular leak, mean gradient of 4 mmHg.

Both patients had an uneventful recovery and are doing well.

## DISCUSSION

Aortic surgeries with aortic valve replacement are commonly time-consuming procedures. The use of available sutureless and rapid deployment valves have resulted in an important cross-clamp and by-pass time reduction<sup>[4]</sup> in comparison with regular valves, at least in valve replacement procedures. Lio et al.<sup>[3]</sup> reported successful utilization of non-conventional valves in combined surgeries (aorta and aortic valve) with reasonable time sparing. Considering the full regulatory acceptance, the growing utilization of these valves around the world and, especially because of their comfortable implantation, complex procedures can be performed in a simpler way. In our cases, the minimally invasive technic was applied, cross-clamp and by-pass time were reasonable, and the results were very good.

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## Authors' roles & responsibilities

IAS	Wrote the paper; final approval of the version to be published
RBC	Reviewed and performed critical analysis; final approval of the version to be published
MVNS	Reviewed and performed critical analysis; final approval of the version to be published
HJBS	Reviewed and performed critical analysis; final approval of the version to be published
GKSP	Reviewed and performed critical analysis; final approval of the version to be published

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