is of utmost importance to prevent such typical complications of cardiac tumors as stroke or embolism.

References

1. Carney JA, Gordon H, Carpenter PC, Shenoy BV, Go VL. The complex of myxomas, spotty pigmentation, and endocrine overactivity. *Medicine (Baltimore)*. 1985 Jul;64:270-83.
2. Sandrini F, Stratakis C. Clinical and molecular genetics of Carney complex. *Mol Genet Metab*. 2003;78:83-92.
3. Boikos SA, Stratakis CA. Carney complex: the first 20 years. *Curr Opin Oncol*. 2007;19:24-9.
4. Borkar SS, Kamath SG, Kashyap N, Sagar SC, Rao L, Warriar R, et al. Carney Complex: case report and review. *J Cardiothorac Surg*. 2011;6:25.
5. Salhab KF, Said SM, Schaff HV. Resection of multiple recurrent cardiac myxomas in an adult man with Carney's complex. *Ann Thorac Surg*. 2012;93:2071.

Initial experience of transcatheter aortic valve replacement with the St Jude Medical Portico valve inserted through the transapical approach

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Video clip is available online.

The St Jude Medical Portico THV (St Jude Medical, Inc, St Paul, Minn) is the first fully resheathable percutaneous valve. We report the feasibility of implantation of the 23-mm St Jude Medical Portico THV by the transapical approach. Despite this encouraging initial experience, future studies are needed to demonstrate the safety and efficacy of this new valve.

CLINICAL SUMMARY

An 82-year-old woman was referred to our center for aortic valve replacement. She was not considered to be a candidate for surgical aortic valve replacement in the evaluation of the heart team because of severe comorbidities (diabetes, hypertension, anemia, recent myocardial infarction requiring percutaneous intervention with left main drug eluting stent implantation, severe peripheral vascular disease) leading to a predicted risk of perioperative mortality of 7.8 as estimated by Society of Thoracic Surgeons

score. An echocardiographic assessment confirmed a severely calcific aortic stenosis (mean gradient 38 mm Hg; aortic valve area: 0.65 cm²) with normal left ventricular function and an aortic annulus of 19.5 mm. A transcatheter aortic valve implantation procedure with the 23-mm Portico valve through the transapical approach was planned. Signed, informed consent was obtained for the procedure and for this publication.

The procedure was performed in the operating room with general anesthesia and echocardiographic and fluoroscopic guidance with a C-arm radiographic system. A standard transapical approach was carried out, as described previously.¹ Initially, a 7F sheath was inserted to secure the access site. After a stiff wire was placed in the descending aorta, the 7F sheath was replaced by a 14F introducer sheath. An aortic valvuloplasty was then performed with an 18-mm balloon, after which the 24F (outer diameter) St Jude delivery system with integrated sheath and mounted Portico valve was inserted through the apex and placed at the aortic annulus level on the stiff wire (Figure 1, A). Rapid pacing was not used for valve deployment. The valve was gradually released by rotating the thumbwheel in a clockwise direction with a continuous tension to keep the position of the distal edge of the skirt at the level of the aortic annulus (Figure 1, B). When 80% of the valve had been released, the positioning was assessed with several angiographic studies (Figure 1, C, and Video 1). The valve was recaptured and repositioned to achieve an optimal position, at which time it was fully released (Figure 1, D). Balloon postdilatation with a 23-mm balloon was performed because of initial mild-to-moderate paravalvular aortic regurgitation (PAR). After balloon and sheath removal, once hemostasis was complete, the chest was closed in a standard fashion. The final result showed trivial PAR and correct positioning

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Disclosures: J.R.-C. is a consultant for Edwards Lifesciences, Inc, and St Jude Medical, Inc, and E.D. is a consultant for Edwards Lifesciences Inc. All other authors have nothing to disclose with regard to commercial support.

Portico is a trademark of St Jude Medical, Inc, St Paul, Minn.

Received for publication April 11, 2013; revisions received May 29, 2013; accepted for publication June 6, 2013; available ahead of print July 25, 2013.

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J Thorac Cardiovasc Surg 2013;146:e24-7

0022-5223/\$36.00

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<http://dx.doi.org/10.1016/j.jtcvs.2013.06.005>

FIGURE 1. Angiographic images showing the steps of St Jude Medical Portico THV (St Jude Medical, Inc, St Paul, Minn) implantation and photographic images of the prosthesis and delivery system. A, The fully sheathed Portico THV. The radiopaque marker is used to guide the valve positioning. B, The valve is fully functional during the deployment process. C, The Portico valve is fully resheathable until full deployment. D, Final result of the Portico THV implantation. E, Detail of the St Jude Medical Portico THV, which consists of 3 pericardial leaflets attached on a nitinol stent. Note the open cells and pericardial cuff designed to minimize paravalvular aortic regurgitation. F, Delivery system after valve deployment. *Black arrow* indicates curved shape of the capsule. *White arrow* indicates radiopaque marker to guide aortic valve positioning at the level of the aortic annulus.

of the valve ([Video 2](#)). The patient was discharged 7 days after the procedure without complications.

At 1-month follow-up, the patient was in functional class II. Echocardiography confirmed correct positioning of the bioprosthesis with a mean gradient of 6 mm Hg, aortic valve area of 1.8 cm², and trivial PAR.

DISCUSSION

The St Jude Medical Portico valve is the first fully resheathable percutaneous valve. It consists of a nitinol self-expanding stent with open cells partially covered by a porcine pericardial cuff, to decrease the risk of PAR, and leaflets of bovine pericardial tissue inserted in a low position for minimizing the protrusion of the stent into the left ventricular outflow tract ([Figure 1, E](#)). The 24F delivery system used for transapical approach is composed of a tapered nose cone, a capsule containing the compressed valve, and a handle with a thumbwheel that allows the release or resheathing of the valve while rotating clockwise or counterclockwise, respectively. The inner shaft contains a radiopaque marker that provides a reference point and contributes, as does the curved shape of the capsule, to a better valve alignment in the aortic annulus ([Figure 1, F](#), *white* and *black arrows*, respectively).

Prosthetic valve positioning remains a challenging step even for expert operators. Improper placement of the stent valve may contribute to some of the most feared complications associated with transcatheter aortic valve implantation, such as stent prosthesis embolization, PAR, mitral impingement, coronary obstruction, and conduction disorders.² During recent years, new-generation transcatheter heart valves have emerged to overcome the shortcomings of the first-generation valves. The main differences among new-generation transcatheter valves implanted through the transapical approach are shown in [Table 1](#). The St Jude Medical Portico prosthesis is currently the only device that is fully retrievable until fully deployed. Although that feature was not used in this case, it would be expected to be associated with a reduced risk of periprocedural complications related to malpositioning of the valve because it allows full control of the valve until final placement. Still, the potential positive impacts of these various features remain speculative.

Despite correct positioning of the bioprosthesis, initial mild-to-moderate aortic regurgitation was observed in this case, requiring balloon postdilatation, with a final trivial PAR. A high degree of valve calcification precluding the complete valve expansion may explain this finding. Inadequate initial radial force represents another

TABLE 1. Mean differences between available second- and third-generation valves for use with the transapical approach

	Type	Frame	Leaflets	Valve level	Delivery system	Repositionable	Fully retrievable*	Aortic regurgitation prevention	Other advantages
Portico (St Jude) ³	Self-expanding	Nitinol	Bovine	Annular	24F (sheathless)	Yes	Yes	Porcine cuff	Open cells preventing coronary obstruction; low leaflet position avoiding frame protrusion in LVOT; anticalcification technology
Engager (Medtronic) ⁴	Self-expanding	Nitinol	Bovine	Supra-annular	29F	Yes	No	Control arms capturing native leaflets	Control arms capturing native leaflets, preventing coronary obstruction; anatomic positioning; commissure markers
JenaValve (JenaValve) ⁴	Self-expanding	Nitinol	Porcine	Annular	32F	Yes	No	Clip fixation of the native leaflets	Clip fixation of the native leaflets, reducing radial forces in LVOT and risk of coronary obstruction; anatomic positioning
Acurate TA (Symetis) ⁴	Self-expanding	Nitinol	Porcine	Annular	28F	No	No	PET skirt; “upper crown” technique	Valve positioning marker; easy deployment
Sapien 3 (Edwards) ⁴	Balloon expanded	Cobalt chromium	Bovine	Annular	18F	No	No	PET skirt; PET sealing ring	Anticalcification technology; valve positioning marker

LVOT, Left ventricular outflow tract; PET, polyethylene terephthalate. *Fully retrievable until fully deployed.

speculative reason. In the recently reported initial experience with the 23-mm Portico THV implanted by the transfemoral approach, however, no postdilatation was used and only 1 in 10 patients had moderate residual aortic regurgitation, comparable to results obtained with other transcatheter valves.³

In addition, the sheathless delivery system used by the St Jude Medical Portico prosthesis is one of the smallest used for transcatheter aortic valve implantation by transapical access, which could prove an advantage in patients with frail apices. Despite the lack of observed complications in this case, however, the absence of a sheath could be associated with apical tearing when the delivery system is

removed and replaced with a sheath in case of the need of postdilatation.

In conclusion, this case reports the feasibility of the 23-mm St Jude Medical Portico THV implantation by the transapical approach. Despite this encouraging initial experience, future studies including a larger number of patients are required to demonstrate the safety and efficacy of this new valve.

References

- Rodés-Cabau J, Dumont E, De LaRochelière R, Doyle D, Lemieux J, Bergeron S, et al. Feasibility and initial results of percutaneous aortic valve implantation including selection of the transfemoral or transapical approach in patients with severe aortic stenosis. *Am J Cardiol*. 2008;102:1240-6.

2. Masson JB, Kovac J, Schuler G, Ye J, Cheung A, Kapadia S, et al. Transcatheter aortic valve implantation: review of the nature, management, and avoidance of procedural complications. *JACC Cardiovascular Interv.* 2009;2:811-20.
3. Willson AB, Rodés-Cabau J, Wood DA, Leipsic J, Cheung A, Toggweiler S, et al. Transcatheter aortic valve replacement with the St. Jude Medical Portico valve: first-in-human experience. *J Am Coll Cardiol.* 2012;60:581-6.
4. Bourantas CV, Farooq V, Onuma Y, Piazza N, Van Mieghem NM, Serruys PW. Transcatheter aortic valve implantation: new developments and upcoming clinical trials. *EuroIntervention.* 2012;8:617-27.

Sutureless aortic valve replacement in the presence of a mechanical mitral prosthesis

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Sutureless aortic valve replacement (AVR) has recently emerged as a promising alternative to standard AVR in patients who have severe aortic stenosis and face a high surgical risk.¹ Because of the excellent survival associated with mechanical mitral valve replacement, it is expected that in the coming years an increasing number of elderly patients who are seen for aortic stenosis will have previously undergone mitral valve replacement. The presence of a mitral prosthesis is considered a contraindication to sutureless AVR, however, because it has been speculated to alter the geometry of the aortic root and left ventricular outflow tract, thus interfering with deployment and stability of the sutureless aortic bioprosthesis. Although transcatheter aortic valve implantation (TAVI) in the presence of a mitral prosthesis has been reported in the literature,² this to our knowledge is the first case report to describe sutureless AVR in a patient with previous mitral valve replacement.

CLINICAL SUMMARY

A 75-year-old woman was admitted for progressive dyspnea of grade III to IV. The patient had a history of mitral stenosis, for which she had undergone mitral replacement 21 years earlier with a mechanical prosthesis (Carbomedics size 29 mm; Sorin Biomedica Cardio Srl, Saluggia, Italy). The history was also positive for hypertension, hyperlipidemia, chronic atrial fibrillation, and an embolic stroke at age 39 years, with residual hemiparesis of the left inferior limb.

A transesophageal echocardiogram revealed the presence of severe aortic stenosis, with an aortic valve area of 0.3 cm² and a mean gradient of 39 mm Hg. The mitral prosthesis was totally functional, with no mitral regurgitation and a mean gradient of 3 mm Hg. The length of the aortomitral continuity was calculated at 10 mm (Figure 1). There was also severe tricuspid regurgitation. The left ventricular ejection fraction was 60%.

The logistic euroSCORE II was calculated at 19.7%. Surgical intervention was scheduled to correct the aortic stenosis and tricuspid regurgitation. A median sternotomy was performed, and cardiopulmonary bypass was initiated with atriobicaaval cannulation. The patient underwent beating-heart tricuspid annuloplasty with a 30-mm Carpentier-Edwards Physio ring (Edwards Lifesciences Corp, Irvine, Calif), followed by sutureless AVR with a 23-mm Perceval S sutureless bioprosthesis (Sorin). Aortic crossclamp and cardiopulmonary bypass times were 31 and 63 minutes, respectively. Weaning from bypass was easy, and the patient was extubated on the same day.

The postoperative course was uneventful. The patient did not demonstrate any conduction abnormalities; however,

FIGURE 1. Preoperative transesophageal echocardiogram illustrating the distance between the mitral prosthesis and the aortic annulus.

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Disclosures: Authors have nothing to disclose with regard to commercial support. Received for publication April 8, 2013; revisions received May 24, 2013; accepted for publication June 5, 2013.

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J Thorac Cardiovasc Surg 2013;146:e27-8

0022-5223/\$36.00

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<http://dx.doi.org/10.1016/j.jtcvs.2013.06.008>