to septal myectomy, significant decreases in residual SAM and superior hemodynamic results have been observed.⁴

In summary, we report the case of a patient with HOCM previously treated with PTSMA but with residual LVOTO caused by SAM. We successfully performed an isolated mitral valve leaflet extension to address the mitral valve apparatus abnormalities. This case report illustrates the importance of surgically treating the mitral valve apparatus in addition to septal myectomy when treating patients with HOCM for LVOTO caused by SAM.

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Transapical double valve implantation plus percutaneous revascularization as a bailout for a high-risk patient

David M. Holzhey, MD, Gerhard Schuler, MD, PhD, Friedrich W. Mohr, MD, PhD, and Chirojit Mukherjee, MD, Leipzig, Germany

Transcatheter aortic valve implantation as a treatment option for severe aortic valve stenosis has become a routine procedure, with encouraging results in a high-risk population.^{1,2} Concomitant treatment of coronary artery disease by percutaneous intervention has been described,³ and single cases and small series of transcatheter mitral valve-in-valve procedures (and even 1 double valve procedure) have been reported.^{4,5} This represents the first description of successful combination of all these procedures.

CLINICAL SUMMARY

A 73-year-old man who had undergone mitral valve reconstruction and bypass surgery 12 years previously was referred to our clinic. He was in New York Heart Association functional class IV.

Echocardiography revealed structural degeneration of the repaired mitral valve with moderate to severe mitral stenosis (pressure gradient maximum/mean ratio, 21/8; effective orifice area, 1.3 cm²) and grade II insufficiency. Additionally, the aortic valve was severely stenosed, with

a gradient of 56/30 mm Hg despite his poor left ventricular function of 18%. There was moderate tricuspid insufficiency, and pulmonary arterial pressure was 66 mm Hg greater than central venous pressure. Coronary angiography showed patent bypass grafts; however, 2 de novo lesions of the proximal right coronary artery needed intervention.

The EuroSCORE was 17 points, with a logistic EuroSCORE of 69.4% (Society of Thoracic Surgeons risk model not available). The heart team chose and the patient agreed to a hybrid approach with percutaneous coronary intervention and transapical aortic and mitral valve implantation.

The aortic annulus was measured at 27 mm with transesophageal echocardiography and computed tomography. Selection of the mitral valve prosthesis was done by precise computed tomographic reconstruction of the I ring, which revealed an inner circumference of 79.5 mm, equaling an inner diameter of 25.3 mm if pressed into a perfectly round shape. Thus 29-mm Edwards Sapien XT valves (Edwards Lifesciences LLC, Irvine, Calif) were selected for both the aortic and mitral positions.

Procedures

Percutaneous coronary intervention with placement of 2 drug-eluting stents in the proximal right coronary artery, was successfully performed 4 days before the transapical procedure (Figure 1).

From the Heart Center Leipzig, Leipzig, Germany.

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Address for reprints: David M. Holzhey, MD, Heart Center Leipzig, Strümpellstraße 39, 04289 Leipzig, Germany (E-mail: dholzhey@web.de).

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FIGURE 1. Percutaneous intervention on the proximal right coronary artery. A, Before the intervention. B, After the intervention.

For the transapical procedure, the apex was exposed through a left lateral minithoracotomy, and 2 purse-string sutures plus a temporary pacemaker lead were placed on the left ventricle. The aortic valve was addressed first. After antegrade passage of the valve and placement of a superstiff wire in the descending aorta, valvuloplasty with a 24-mm balloon and consecutive valve implantation were performed under rapid pacing. After the implantation, blood pressure did not recover, and mechanical cardiopulmonary resuscitation was necessary for 2 minutes. The patient recovered without the need for a heart–lung machine and remained in stable condition thereafter.

The decision to continue with the mitral valve was made. The stenosed mitral valve was passed, a 14F sheath was

brought in through the valve, and a stiff wire was placed in the left atrium. Balloon valvuloplasty was performed with a 26-mm balloon. The 29-mm valve prosthesis crimped for the mitral position was placed within the mitral ring and expanded very slowly, aiming for a position 1 third in the atrium and 2 thirds in the ventricle (Figure 2). Results were checked by transesophageal echocardiography, which showed a perfect result of the aortic valve with no regurgitation and a gradient of 13/7 mm Hg. Mitral valve function was also good, with 2 trivial jets between the prosthesis and the ring and a Doppler gradient of 11/4 mm Hg.

With moderate inotropic support, implantation of an intra-aortic balloon pump was considered. One was not placed, however, because of the severe peripheral artery disease and a 85% stenosis of the superior mesenteric artery.

FIGURE 2. Transapical double valve implantation. A, Initial aortic root shot. B, Implantation in the aortic position. C, Result of the aortic valve implantation. D, Valvuloplasty of the mitral ring. E, Implantation in the mitral position. F, Final result.

Postoperative Course

The patient's condition stabilized, and sedation was discontinued the first postoperative day. The patient was free of inotropic support on day 3 and was successfully extubated. He showed no neurologic abnormalities and no rhythm disorders. The patient was discharged 20 days postoperatively, and he was alive and well (New York Heart Association functional class II) on postoperative day 61.

DISCUSSION

Transcatheter aortic valve implantation as a treatment option for severe aortic valve stenosis has been a major development in cardiovascular medicine of the last 5 years and has become a routine procedure at many hospitals. Recent studies have shown encouraging results, especially considering the high-risk population that has been treated.^{1,2} Concomitant treatment of coronary artery disease by percutaneous intervention has been described.³ In addition, single cases or small series of transcatheter mitral valve-in-valve procedures, as well as 1 double valve procedure, have been reported.^{4,5} The combination of all these procedures, however, has never before been successfully performed. The case presented here was thoroughly discussed by a heart team after conventional surgery was denied. All involved persons, including the patient, were aware of the

fact that this hybrid approach could fail at any step of the procedure. It was, however, considered the least risky option for the patient. There was also general agreement that treating only some of the problems did not have sufficient potential for symptom relief and might on the contrary present a risk for slow postoperative recovery.

The procedural planning and conduct of this heart team provides a good example of how treatment options can be expanded for patients with a very high operative risk by good collaboration between cardiologists and cardiac surgeons.

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Treatment of large subglottic tracheal schwannoma with microdebrider bronchoscopy

Jose Melendez, MD,^a Lorraine Cornwell, MD,^b Linda Green, MD,^c and Roberto F. Casal, MD,^a Houston, Tex

Primary tracheal schwannomas are among the least common tracheal tumors.¹ Although endoscopic treatment with the Nd:YAG laser has been reported, surgical resection remains the standard of care.^{2,3} We report here the successful use of a novel bronchoscopic technique, the

microdebrider, for the management of a large subglottic tracheal schwannoma.

CLINICAL SUMMARY

A 63-year-old man was referred to our institution for diagnosis and management of a large endotracheal mass detected in a computed tomographic scan of the chest during evaluation for dyspnea. We performed rigid bronchoscopy, finding a mass on the posterior wall of the trachea, 2 cm from the vocal cords, with approximately 90% obstruction of the lumen (Figure 1, A). This mass was sessile, round, and broad based. Endobronchial ultrasonography was used to assess the vascularity of the lesion and its relationship to the esophagus, and to obtain a needle aspiration specimen for preliminary diagnosis. On-site cytologic examination showed a spindle cell tumor. The patient was considered to be a poor surgical candidate

From the Departments of Pulmonary and Critical Care Medicine,^a Cardiothoracic Surgery,^b and Pathology and Immunology,^c Michael E. DeBakey VA Medical Center, Baylor College of Medicine, Houston, Tex.

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Address for reprints: Roberto F. Casal, MD, Department of Pulmonary and Critical Care Medicine, Baylor College of Medicine, Michael E. DeBakey VA Medical Center, 2002 Holcombe Blvd, Pulmonary Section 111i. Houston, TX 77030 (E-mail: casal@bcm.edu).

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