The current patient is, to our knowledge, the oldest reported to undergo explantation of an SE valve, and the duration of implantation is the longest reported. The case demonstrates the efficacy and safety of double valve replacement for delayed hemolysis in a mechanical valve, even in patients in whom the valve has been seated for more than 4 decades.

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Two cases of aneurysm of the anterior mitral valve leaflet associated with transcatheter aortic valve endocarditis: A mere coincidence?

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The incidence of transcatheter aortic valve endocarditis (TAVE) is currently unknown. To the best of our knowledge, 2 clinical case reports of TAVE have been published (1 Edwards SAPIEN [Edwards Lifesciences, Irvine, Calif] and 1 Medtronic CoreValve ReValving System [Medtronic CV, Luxembourg Sarl]).^{1,2} Interestingly, both cases were associated with aneurysm and perforation of the anterior mitral valve leaflet—a link that has not been previously reported. We briefly review the clinical presentations of these cases and discuss the possible implications of endocarditis in the context of transcatheter aortic valve implantation.

CLINICAL SUMMARIES

Patient 1

CoreValve ReValving System (Figure 1, A and B). Comoglio and associates¹ reported a case of TAVE in a 66-year-old man who underwent transfemoral aortic valve

implantation with the CoreValve ReValving System. The prosthesis was positioned too low into the left ventricular outflow tract, resulting in moderate paravalvular aortic regurgitation. After postimplant balloon dilatation, the aortic regurgitation was reduced to a mild-moderate degree. The postoperative course was complicated by ventricular arrhythmias of unknown etiology. One month after the procedure, the patient was readmitted with heart failure and recurrent ventricular arrhythmias. Echocardiography revealed moderate paravalvular aortic regurgitation, preserved left ventricular function, but progressive left ventricular dilatation. Three months after implantation, the patient had fever and blood cultures positive for *Corynebacterium*. Transesophageal echocardiography showed severe mitral regurgitation resulting from a perforated aneurysm of the anterior mitral valve leaflet at the level of the ventricular edge of the metal frame. The patient underwent surgical aortic valve replacement with a 23-mm Carpentier-Edwards bioprosthetic valve (Edwards) and pericardial patch repair of the anterior mitral valve leaflet. In addition to a vegetative lesion observed on the transcatheter aortic valve cusp, the left main coronary artery ostium was obstructed by a strut of the CoreValve frame. The postoperative course was uneventful and the patient was discharged on postoperative day 7.

Patient 2

Edwards SAPIEN prosthetic heart valve (Figure 1, C and D). Wong and associates² reported a case of TAVE in an 88-year-old man who underwent transfemoral aortic valve implantation with a 26-mm Edwards SAPIEN

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FIGURE 1. Patient 1 (CoreValve ReValving System): A, Transesophageal echocardiogram demonstrated aneurysm of the anterior mitral valve leaflet (*green arrow*) at the contact point between the ventricular edge of the CoreValve metallic frame and anterior mitral valve leaflet (*yellow arrow*). B, Severe mitral regurgitation secondary to perforation of the mitral valve aneurysm (*white arrow*). Patient 2 (Edwards SAPIEN): C, Transesophageal echocardiogram demonstrated aneurysm of the anterior mitral valve leaflet (*white full arrow*) at the contact point between the ventricular edge of the Edwards metallic stent and anterior mitral valve leaflet (*white arrowhead*). D, Two mitral regurgitant jets can be appreciated: one transvalvular (*white arrowhead*) and one through the perforated mitral valve leaflet (*white arrow*).

prosthetic heart valve. Among other comorbidities, the patient had a history of coronary artery bypass graft surgery.

The prosthesis was positioned too low within the left ventricular outflow tract. Postimplant dilatation was performed to mitigate moderate paravalvular aortic regurgitation. At 6 months' follow-up, echocardiography demonstrated trivial aortic and mitral regurgitation. Eleven months after implantation, the patient had fever and *Streptococcus anginosus* on blood cultures. A dental visit 6 weeks earlier and lack of endocarditis prophylaxis were recorded. Transesophageal echocardiography revealed mild–moderate aortic regurgitation and severe mitral regurgitation owing to a ruptured aneurysm of an anterior mitral valve leaflet located at the contact point of the ventricular edge of the metal stent. The patient underwent redo sternotomy that involved surgical aortic valve replacement with a 25-mm bioprosthesis and pericardial patch repair of the anterior mitral valve leaflet. The postoperative course was complicated by renal failure, pneumonia, delirium, and dysphagia, and he was discharged on postoperative day 38.

DISCUSSION

Although occurring rarely, mitral valve aneurysm is a widely known complication in patients with aortic valve endocarditis. It is caused by the development of satellite

infection on the anterior mitral leaflet.^{3,4} By virtue of their design characteristics and final positioning, transcatheter aortic valves may lie in contact with the anterior mitral valve leaflet, intervalvular fibrosa, ventricular septum, aortic root, and ascending aorta. As a result of the contacting surface, transcatheter aortic valves may facilitate satellite infection to these surrounding structures (“bridging endocarditis”). In the 2 cases examined here,^{1,2} the prostheses were implanted too low and as a result were in contact with the anterior mitral valve leaflet. Aneurysm of the anterior mitral valve leaflet occurred at the site of contact between the ventricular edge of the infected prosthesis and the anterior mitral valve leaflet. Possibly, tissue injury and endothelial denudation, caused by repetitive friction between the ventricular edge of the prosthesis and the anterior mitral valve leaflet with each heartbeat, might have been a nidus for infection and/or might have promoted aneurysm formation and subsequent rupture.

These cases highlight the importance of valve design, valve positioning, and possible complications and extensive surgical repairs that may be required after TAVE. Of even greater importance, these 2 cases should remind us that the concept of sterile “surgical” technique should be mirrored in the cardiac catheterization laboratory during transcatheter valve procedures.

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Video-assisted anterior approach to Pancoast tumors

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Significant advances in the treatment of Pancoast tumors have been made over the past 50 years. Some advances have been in neoadjuvant treatments, whereas others have been in surgical technique. The classic approach to Pancoast tumors involves a posterolateral thoracotomy extending posteriorly to the base of the neck. With tumors invading the anterior aspects of the first rib or subclavian artery or vein, an anterior approach is helpful. Darteville and colleagues¹ pioneered the anterior cervicothoracic approach with an L-shaped incision paralleling the anterior border of the sternocleidomastoid muscle down the midline to the level of the second or third ribs, extending laterally to the deltopectoral groove. The medial clavicle is resected. Excellent exposure of the subclavian vessels, anterior aspects of ribs, and brachial plexus is possible through this incision. Lobectomy is performed after detachment of the chest wall. Grunenwald and Spaggiari² described a clavicle-sparing modification of the anterior approach involving detachment and elevation of the clavicle with an attached portion of sternum to gain access to the first rib and thoracic inlet. With either approach, a simultaneous posterolateral thoracotomy has been advocated for completing the upper lobectomy and nodal dissection.³

Described here is the novel use of video-assisted thoracic surgery (VATS), rather than thoracotomy, to dissect the pulmonary vessels and perform a nodal dissection after chest wall resection via the anterior, clavicle-sparing approach. The VATS approach is of greatest utility when there is limited invasion of the apical chest wall (Figure 1).

FIGURE 1. Thoracoscopic view of a Pancoast tumor invading the thoracic inlet at the level of the first rib and above.

TECHNIQUE

The patient is placed in the supine position with a vertical roll under the lateral chest elevating the operative side. The arm is rested posteriorly behind the roll on the operating room table. An incision is made from the inferior edge of the anterior border of the sternocleidomastoid muscle, down the midline of the sternum, to the top of the second rib extending laterally over the border of the second rib (Figures 2 and 3). The pectoral muscle is lifted off the chest wall. The sternum is divided in the midline from the level of the sternal notch to the top of the second rib. An oscillating saw is used to “T-off” the sternal incision. A blunt right angle is used to dissect between the head of the clavicle and the insertion of the first rib, and a Gigli saw is used to detach the insertion of the first rib into the sternum. A blunt periosteal elevator can be used to dissect the subclavian vessels away from the clavicle, and the clavicle is retracted anteriorly. The subclavian vein, anterior scalene muscle, and subclavian artery are inspected, and if there is no invasion, they are dissected away from the first rib with a blunt periosteal elevator. The posterior aspect of the first rib is divided.

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