TABLE 1. Continued

Case	First author and year	Age (y)	Sex	Clinical presentation	Surgical access	Tumor site	CPB	Surgical procedure	Outcome	Pathology
29	Sogawa 2012	73	M	NA	Sternotomy	RVOT	Y	Total excision	Alive and well, 24 mo	Cardiac hemangioma
30	Jiang 2013	49	M	NA	Sternotomy	Apex of RV	Y	Total excision	Alive and well, 6 mo	Cardiac hemangioma

CPB, Cardiopulmonary bypass; F, female; RV, right ventricle; NA, not available; RA, right atrium; M, male; RVOT, right ventricular outflow tract; RH, right heart; LV, left ventricle; PA, pulmonary artery; Ao, aorta.

Functioning Cooley-Cutter aortic valve prosthesis 40 years after implantation

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Video clip is available online.

The development of artificial heart valves has revolutionized cardiac surgery. During the past 60 years, heart valve prostheses have evolved considerably, with each new model designed with the hope of better hemodynamics and outcomes for patients. The Cooley-Cutter heart valve was designed in the 1960s by Denton A. Cooley, MD, in collaboration with Cutter Laboratories and introduced for clinical use in 1971.¹ The device used 2 sets of titanium struts to contain a biconic occluder composed of pyrolytic carbon. Cooley-Cutter heart valves were used frequently in the 1970s,² with Dr Cooley alone having implanted the device in a total of 3275 patients (1786 in the aortic position and 1475 in the mitral) over a 10-year period, with very good clinical results.³ Since that time, newer mechanical valves have replaced the Cooley-Cutter valve.

CLINICAL SUMMARY

An 85-year-old man with a medical history significant for diabetes, coronary artery disease, previous stent placement

in the left anterior descending coronary artery, and previous mechanical aortic valve replacement was seen for dyspnea on exertion and minor weight loss. The patient's surgical history was significant for aortic valve replacement with a Cooley-Cutter prosthesis, implanted by Dr Cooley at the Texas Heart Institute on October 4, 1973. Results of physical examination were unremarkable; cardiac examination revealed regular rate and rhythm with S1 and S2, no S3 or S4, and no appreciable murmurs, rubs, or gallops.

Transthoracic echocardiography (Figure 1) showed an intact aortic valve replacement. The valve was properly seated with normal occluder motion. The peak transvalvular velocity was 3.4 m/s, with a mean gradient of 24 mm Hg. The left ventricular ejection fraction was calculated to be 60%.

DISCUSSION

A recent single-center retrospective review of the results of the use of the St Jude mechanical valve⁴ demonstrated a 25-year survival of 17% ± 4%. In the context of these results, it is high unusual to document such excellent functional results as those of this 40-year-old Cooley-Cutter prosthesis. Another mechanical aortic valve prosthesis that has been shown to be remarkably durable in certain cases is the Starr-Edwards prosthesis.⁵ Our patient's symptoms were ultimately found to be unrelated to his cardiac history, and he currently remains well controlled on warfarin. Overall, the prosthetic valve remains in excellent condition with no need for replacement.

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FIGURE 1. Cooley-Cutter aortic valve in situ. Fluoroscopic images of the valve in diastole (A) and in systole (B). Parasternal long-axis view depicting the valve in diastole (C) and in systole (D). E, Continuous-wave Doppler from the left parasternal position demonstrating a peak transvalvular velocity of 3.4 m/s with a mean gradient of 24 mm Hg.

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