

# Starr-Edwards Caged-Ball Mitral Valve:

Still Working after 41 Years

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In 1973, a 10-year-old boy with rheumatic mitral stenosis underwent mitral valve replacement with use of a Starr-Edwards caged-ball valve (SECBV) model 6120. In March 2013, the adult patient presented with severe aortic stenosis and underwent mechanical aortic valve replacement. In June 2014, at age 51 years, he was admitted to our hospital with atrial fibrillation. A transthoracic echocardiogram showed an aortic valve prosthesis with mild regurgitation, left atrial enlargement to dimensions of  $4.5 \times 5$  cm, a left ventricular ejection fraction of 0.52, and—of note—a well-functioning SECBV without regurgitation, a peak mitral velocity of 2.14 m/s, a moderate early diastolic gradient (18.37 mmHg), and a mild mean gradient (8.31 mmHg) (Fig. 1). There was no paravalvular leak. The effective orifice area of the mitral valve was  $2.5 \text{ cm}^2$ —normal for this type of prosthesis. Cine fluoroscopic images of the mitral valve showed normal silicon-ball movements toward the cage in diastole and closure in systole (Fig. 2). The patient was discharged from the hospital on medical therapy and had New York Heart Association class I functional capacity one month later.

## Comment

The SECBV, first implanted in September 1960,<sup>1</sup> played an important role in valve surgery until bileaflet mechanical valves were introduced. We found 2 other instances of  $\geq 40$ -year function of this prosthesis in the mitral position. In one case, an SECBV remained functional as of 2010, after its implantation 44 years before.<sup>2</sup> The other report described the explantation of an SECBV after 45 years because of paravalvular

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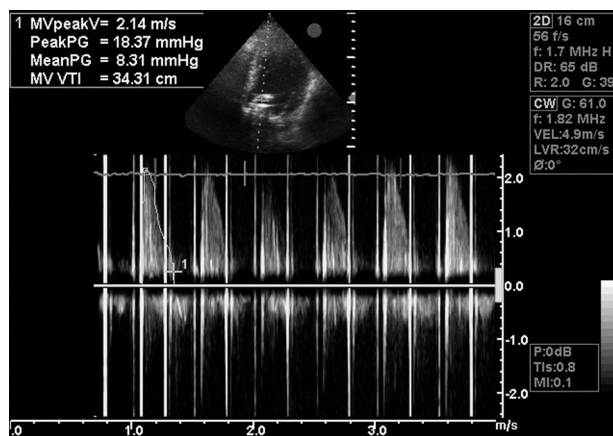
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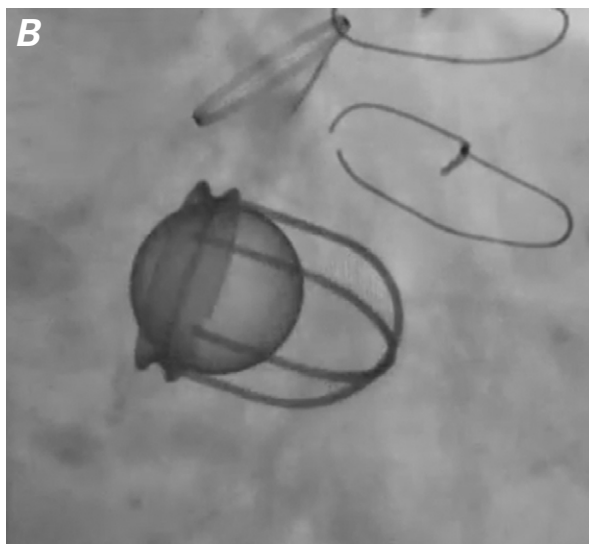
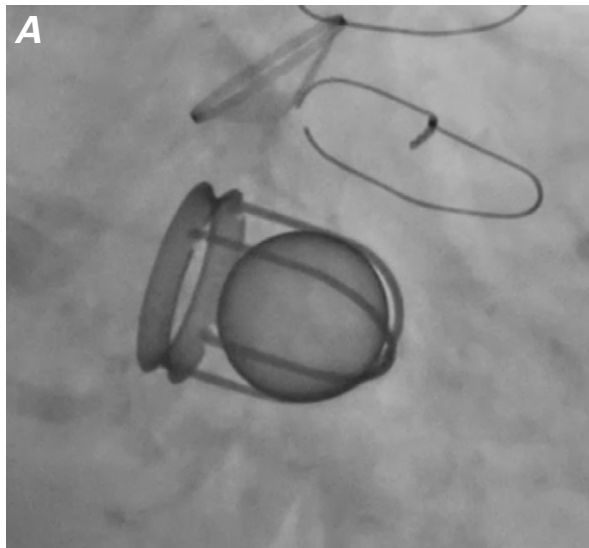
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**Fig. 1** Transthoracic echocardiogram at the level of the Starr-Edwards mitral prosthesis (apical approach). Flow velocity across the prosthesis corresponds to a moderate early diastolic gradient (18 mmHg), a mild mean diastolic gradient (8 mmHg), and a peak mitral velocity of 2.14 m/s. The effective orifice area is  $2.5 \text{ cm}^2$ .

MeanPG = mean-to-peak gradient; MVpeakV = mitral valve peak velocity; MVVTI = mitral valve velocity-time integral; PeakPG = peak-to-peak gradient



**Fig. 2** Fluoroscopic images show normal silicon-ball movement **A)** toward the cage in diastole and **B)** closed in systole.

[Supplemental motion image is available for Figure 2.](#)

leak.<sup>3</sup> Our patient's SECBV has remained completely functional in the mitral position for 41 years.

## References

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