Spiral ventricular septation

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Video clip is available online.

A 19-year-old woman with double-inlet left ventricle, who had undergone banding of the pulmonary trunk at 2 years of age, had a history of ventricular septation performed in 1998 when she was 4 years old (Figure 1).¹ Intraoperative transesophageal echocardiography revealed the location of the patch used for septation, which had been attached between the atrioventricular orifices proximally and the ventriculoarterial junctions distally. After the procedure, the patient had lived uneventfully, undergoing regular follow-up. In 2012, 14 years after the septation procedure, she underwent scheduled computed tomography. We were

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FIGURE 1. Operative procedures included enlargement of the ventricular septal defect by resection of its anterosuperior border (arrow), debanding, and ventricular septation through insertion of a straight composite patch with a total of 18 stitches with pledgets (arrowhead), including 3 transapical stitches through the anterosseptal free wall. Ao, Aorta; LA, left atrium; PT, pulmonary trunk; RA, right atrium; LAVV, left atrioventricular valve; RAVV, right atrioventricular valve; LV, left ventricle.

FIGURE 2. Follow-up cardiac computed tomographic imaging with 3-dimensional volume rendering (Video 1) 14 years after the insertion of a straight prosthetic patch attached proximally between the ventricular inlets and distally between the ventricular outlets. A, Right anterior oblique view; B, anteroposterior view; C, left anterior oblique view. The septum between the newly separated left and right sides of the initial dominant left ventricle, shown in sky blue, was unable to expand yet has an obvious spiral configuration, as does the remainder of the new septum, which is growable myocardium, as can be inferred from the location of the 3 calcified pledgets (3 arrowheads in A), which were used to hold 3 transapical stitches. Ao, Aorta; PA, pulmonary artery; LA, left atrium; RA, right atrium; RV, right ventricle; LV, left ventricle.

able to use the location of the Dacron polyester fabric pledgets, which had been inserted to hold the interrupted stitches around the margins of the patch (Figure 1, arrowheads) and had since calcified (Figure 2, arrowheads) to delineate the exact septal patch shape. Three-dimensional reconstruction revealed a marked spiral configuration, with its attachment between the ventricular inflows being perpendicular to its distal attachments between the subpulmonary and subaortic outlets (Figure 2 and Video 1). It had been our impression that we inserted a straight patch; however, imaging showed an obvious spiral configuration. This of course was the consequence of the preexisting alignment of the lines of separation between the ventricular inlets and outlets at more or less right angles to one another. To the best of our knowledge, such spiraling of a surgically inserted ventricular septum has not previously attracted attention, perhaps because our patient had concordant ventriculoarterial connections,¹ in contrast to the more usual discordant connections found in the setting double-inlet

left ventricle.^{2,3} The images also reveal, as demonstrated by the locations of the 3 calcified pledgets that were used to hold the 3 transapical stitches, the presence of a newly acquired muscular apical component to the septum, which is potentially growable, in contrast to the prosthetic component of the patch obviously showing no evidence of expansion. The images show the potential of producing a virtually normal spiral arrangement of biventricular intracardiac structures when it proves possible to septate the hearts of patients born with double-inlet left ventricle.

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