Late rhythm changes after operative closure of a ventricular septal defect

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A man whose congenital ventricular septal defect (VSD) was closed operatively in childhood apparently remained in sinus rhythm into his mid-30s. Like most VSD closures, his almost certainly was performed through a right ventriculotomy, and all of his electrocardiograms (ECGs) demonstrated the resulting right bundle branch block (*Figure 1*). An ECG recorded at age 39 years revealed atrial flutter with 2:1 atrioventricular block and a ventricular rate of 105 beats per minute (*Figure 2*).

On the same day that the ECG in *Figure 2* was recorded, an echocardiogram revealed an intact VSD patch and generalized

left ventricular hypokinesis with an ejection fraction of 35% (reference >55%). A week later, his rhythm was still atrial flutter but now with a variable ventricular response (*Figure 3*).

Five weeks later, the patient's ECG showed sinus rhythm with a rate of 68 beats per minute, and an echocardiogram the same day showed good left ventricular function with an ejection fraction >55%.

Atrial flutter has often occurred after operations for congenital heart disease but usually after repair of tetralogy of Fallot or operations on the atria, such as repair of an atrial septal defect, or after a Fontan, Mustard, Senning, or Blalock-Hanlon procedure.^{1,2} In a

Figure 1. Electrocardiogram when the patient was 35 years old showed sinus rhythm at a rate of 83 beats per minute, right bundle branch block, and left posterior fascicular block.

Figure 2. Electrocardiogram recorded at age 39 years demonstrated slow atrial flutter at a rate of 210 beats per minute with 2:1 atrioventricular block resulting in a ventricular rate of 105 beats per minute. The electrocardiogram was otherwise unchanged from 4 years earlier.

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Figure 3. Electrocardiogram recorded a week after the electrocardiogram in Figure 2 showed atrial flutter again with a rate of 210 beats per minute but the ventricular response had become variable.

patient like ours with repair of an isolated VSD via a right ventriculotomy and use of a patch to close the defect, ventricular tachyarrhythmias would be more likely than atrial flutter.

An echocardiogram showing a depressed left ventricular ejection fraction was recorded during atrial flutter of unknown duration. Five weeks later, the patient was in sinus rhythm at a rate of 68 beats per minute, and his left ventricular ejection fraction was >55%. Thus, he possibly had a transient tachycardia-induced cardiomyopathy.³

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