A 34-year-old man presented for evaluation of palpitations. Eight years earlier, he had undergone orthotopic heart transplantation for nonischemic cardiomyopathy. During the electrophysiology study, atrial tachycardia (cycle length, 220 ms) originating in the recipient atrium was present at baseline. Atrioatrial conduction from the recipient atrium to donor atrium was present with 2:1 conduction block (Figure), resulting in a donor atrial cycle length of 440 ms, exactly twice that observed in the recipient atrium. The first and third recipient atrial electrograms were not conducted to the donor atrium, but the second and fourth electrograms were conducted.

Concurrently, there was 2:1 atrioventricular block between the donor atrium and the donor ventricle. The first and third donor atrial electrograms were conducted through the atrioventricular node to the His bundle and ventricle, whereas the second and fourth donor atrial electrograms were blocked in the atrioventricular node above the His bundle. As a result, the ventricular cycle length (880 ms), as seen in the His electrode and on the surface ECG, is exactly twice that observed in the donor atrium and exactly 4 times that observed in the recipient atrium. In other words, block in a 4:2:1 pattern is present.

Radiofrequency catheter ablation of the atrioatrial connection abolished recipient-to-donor atrial conduction and restored donor atrium sinus rhythm. Atrioatrial conduction may occur in up to 10% of patients who have had a heart transplantation for >5 years. This conduction is a potential cause of palpitations and arrhythmia and can be cured with radiofrequency ablation.1

Reference

Less Is More: 4:2:1 Block
William H. Maisel, William G. Stevenson, Stanley Tung, Louis E. Blier and Corinna B. Brunckhorst

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