Images in Cardiovascular Medicine

Severe Tricuspid Regurgitation With Giant C-V Waves After Pacer Implantation

Jarrod D. Frizzell, MD; Michael B. West, MD; Richard L. Snider, MD

A 79-year-old man underwent atrial flutter ablation and placement of biventricular pacer for intermittent complete heart block. His medical history is significant for Ehlers-Danlos syndrome and associated valvular heart disease, status post–aortic valve replacement with a bioprosthetic valve 2 years earlier. A transthoracic echocardiogram (TTE) 2 months before the procedure showed a bioprosthesis with moderate valvular stenosis, mild mitral regurgitation without prolapse, and mild tricuspid regurgitation (TR) without prolapse. His atra were dilated, and left ventricular function was normal. During the TTE, the patient was in normal sinus rhythm; the right ventricular inflow view of the tricuspid valve is shown in Movies I and II in the online-only Data Supplement. Maximum TR velocity by using continuous-wave Doppler of the regurgitation was 4.2 m/s, and TR was grade 3/4. The patient was in atrial fibrillation and was ventricular-paced, with waveforms comparable with baseline, although the ventricle remained somewhat dilated (Movies VIII and IX in the online-only Data Supplement). Over the course of the next few months, the patient did well with a return to baseline functional status and resolution of the bulging pulsation in the neck. A TTE 2 months after the procedure while in a paced rhythm showed only mild TR, with waveforms comparable with baseline, although the ventricle remained somewhat dilated (Movies VIII and IX in the online-only Data Supplement, Figure 6).

TR is a common complication of right ventricular pacer lead implantation, although the literature is mixed regarding worsening of TR. Severe TR after lead placement is very uncommon, and right-sided heart failure is rare. Acoustic shadowing from the lead may also lend itself to difficulty interpreting the severity of TR on echocardiography. This case is atypical in progression from mild to severe TR, whereas most patients have a worsening by only 1 grade on a 1+ to 4+ scale. In this patient, Ehlers-Danlos syndrome may have contributed to the severity of TR, although some evidence shows the tricuspid valve may be the least involved valve in Ehlers-Danlos syndrome-related valvar abnormalities. Currently, limited data exist about the best management of lead-related TR, including which option is preferred among lead extraction, surgical revision, or medical management only. It was psychologically important to this patient to remove the lead, and extraction timing was close enough to the original procedure to be considered lower risk.

Disclosures

None.

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References


Figure 1. Continuous-wave Doppler waveforms of mild TR, with maximum TR velocity of ≈2.7 m/s. TR indicates tricuspid regurgitation.

Figure 2. Still-frame image from echocardiogram showing malcoaptation of tricuspid valve leaflets with pacer lead.

Figure 3. Still-frame image from echocardiogram with Doppler imaging showing severe tricuspid regurgitation.

Figure 4. Continuous-wave Doppler waveforms of the severe tricuspid regurgitation, with maximum regurgitation velocity of ≈2.5 m/s. Note much denser waveforms in comparison with baseline.
Figure 5. Right atrial pressure waveform showing giant C-V waves taken during right ventricular pacer lead removal.

Figure 6. Continuous-wave Doppler waveforms of TR 2 months after lead extraction, showing waveforms comparable to baseline, with much less density than before lead extraction. TR indicates tricuspid regurgitation.
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