

## Patient Report

# Secondary cardiomyopathy due to incessant supraventricular tachycardia in a child

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Myocardial dysfunction due to incessant tachycardia is known as tachycardia-induced cardiomyopathy or tachycardiomyopathy, and some cases have shown full recovery within a month after control of the arrhythmia was established.<sup>1</sup>

We present an asymptomatic child with supraventricular tachycardia showing cardiomegaly on chest X-ray and left ventricular dysfunction on echocardiography.

## Case report

A 3-year-old girl, in whom tachycardia had been noted since 2 years of age without apparent preceding viral infection, was transferred to Saitama Children's Medical Center, Saitama, Japan, under a diagnosis of dilated cardiomyopathy and tachycardia by a local physician. The chest X-ray showed cardiomegaly (cardiothoracic ratio, 68%; Fig. 1), and echocardiography showed left ventricular dysfunction (LVEF, 40%; Fig. 2). Incessant supraventricular tachycardia with a maximal rate of 220 b.p.m. was observed on electrocardiogram (ECG) (Fig. 3). The P wave was visible in all leads, and a narrow P wave with a higher rate was observed after sinus wave in lead II (Fig. 3). Acute myocarditis was not suspected because there was no abnormal T wave inversion or low voltage in ECG, and an abnormally high serum CK level was not observed.

Adenosine triphosphate disodium infusion was not successful, and conventional antiarrhythmic drugs were not effective. The arrhythmia was finally controlled with amiodarone, propranolol and digoxin, and the cardiomegaly and left ventricular dysfunction disappeared within a month. The arrhythmia was diagnosed as ectopic atrial tachycardia in

electrophysiologic testing and the child underwent successful catheter ablation.

## Discussion

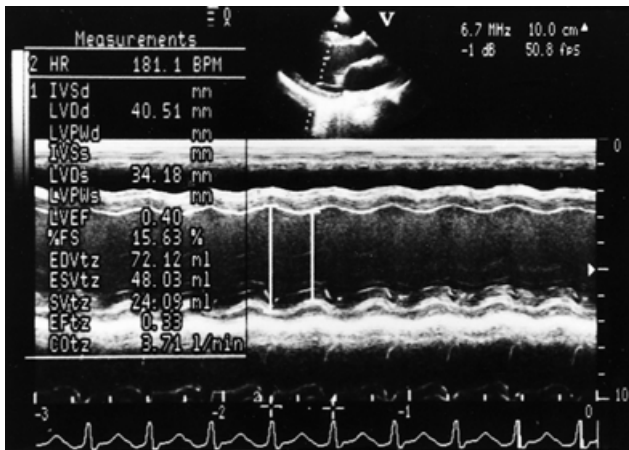
Tachycardia-induced cardiomyopathy is frequently observed in children and newborns with tachyarrhythmia.<sup>1–3</sup> Animal studies have shown decreased ventricular function during rapid pacing (250 b.p.m.) and architectural remodeling of the myocardium with interstitial edema.<sup>4</sup> The recovery of ventricular function may be related to the severity of myocardial damage caused by tachycardia.<sup>3</sup>



**Fig. 1** Chest X-ray showing increased cardiothoracic ratio.

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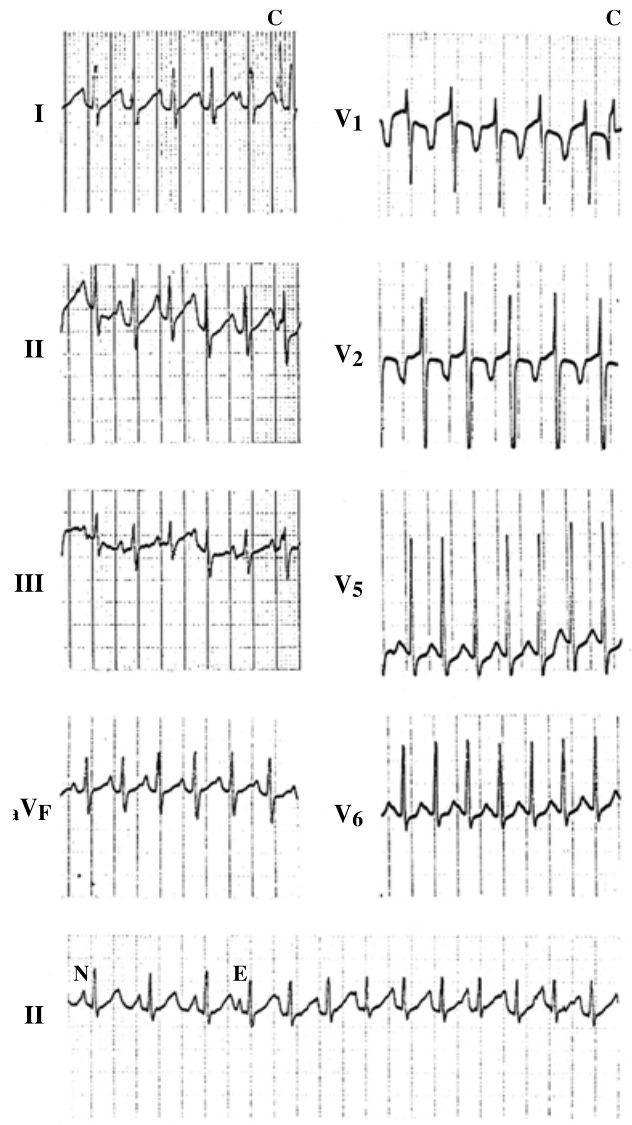


**Fig. 2** M-mode tracing of left ventricle in echocardiography, showing decreased left ventricular ejection fraction (EF = 40%).

When we see cardiomegaly on chest X-ray, and left ventricular dysfunction on echocardiography in a patient with tachyarrhythmia, we should consider tachycardiomyopathy in the differential diagnoses, and control of arrhythmia should be in the first line of therapy.

## References

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**Fig. 3** Electrocardiogram showing supraventricular tachycardia. Rapid P wave was distinguished from sinus wave in lead II. C, calibration; N, sinus P wave; E, ectopic P wave.