

# Acute rheumatic fever presenting with severe endocarditis involving four valves, and ventricular tachycardia

## Brief Report

**Cite this article:** Ramoğlu MG, Epçaçan S, Yeşilbaş O. (2019) Acute rheumatic fever presenting with four valves involved severe endocarditis and ventricular tachycardia. *Cardiology in the Young* 29: 78–81. doi: 10.1017/S1047951118001518

Received: 4 July 2018  
Accepted: 27 July 2018  
First published online: 30 August 2018

### Key words:

Acute rheumatic fever; endocarditis; arrhythmia; ventricular tachycardia

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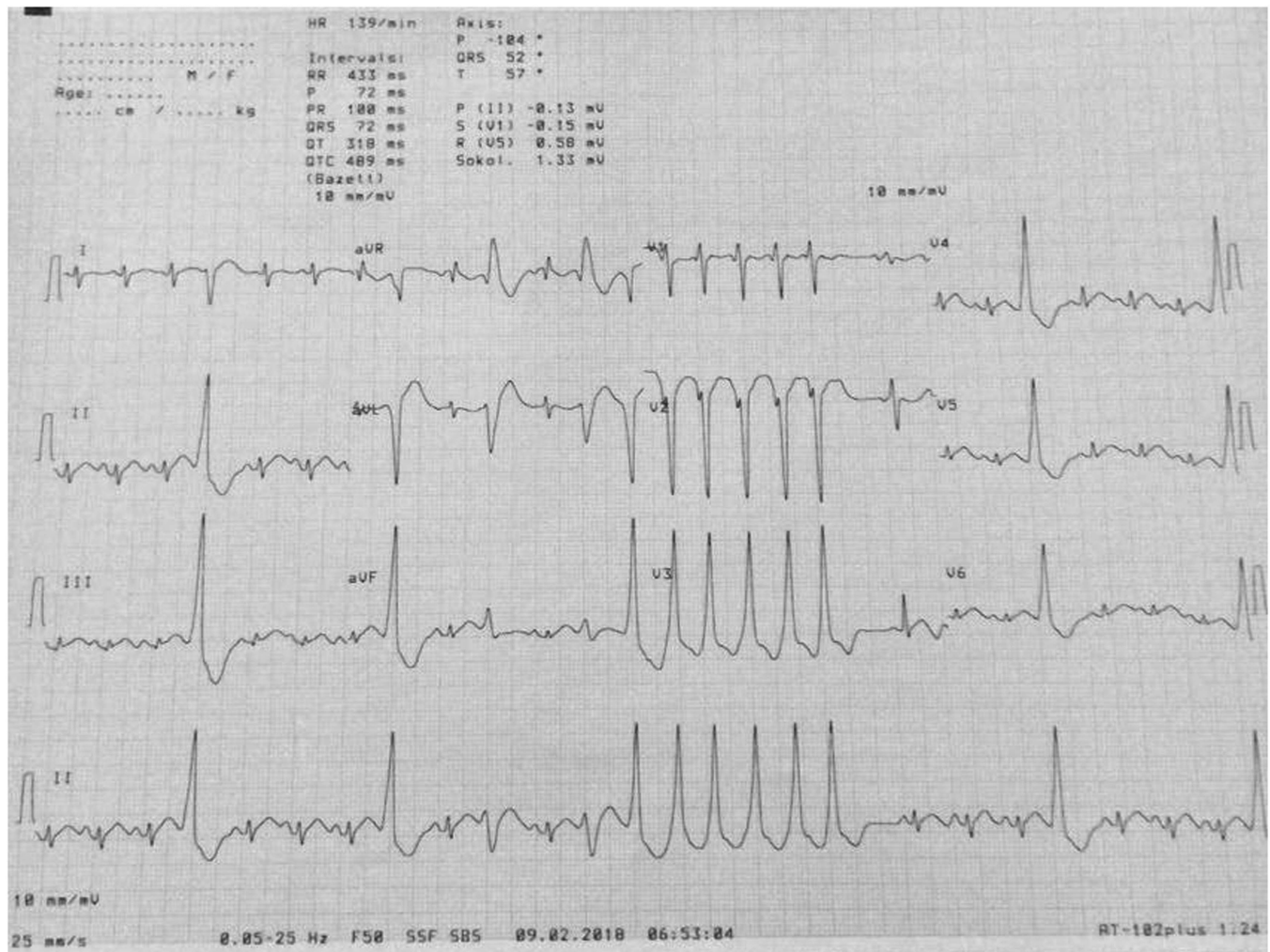
### Abstract

Acute rheumatic fever is the most commonly acquired heart disease in developing countries. The most common cardiac presentation is valvular disease. Although some rhythm disturbances may occur during the acute stages of the disease, ventricular tachycardia is extremely rare. Here, a case of acute rheumatic fever with severe endocarditis involving four valves and ventricular tachycardia is presented.

Acute rheumatic fever is the most common acquired heart disease in developing countries. It is characterised by varying involvement of the heart, joints, central nervous system, skin, and subcutaneous tissues.<sup>1</sup> The most common presentations of the acute disease are arthritis and carditis, and cardiac involvement may present as pancarditis. Various rhythm problems such as first- and second-degree atrioventricular blocks and junctional tachycardia may occur during the acute stage of the disease.<sup>2</sup> Here, acute rheumatic fever presenting with severe endocarditis and ventricular tachycardia, which has been reported only in two cases, is described to emphasise on the rhythm problems that may occur in the acute stages of the disease.

### Case report

A 7-year-old boy was referred to the paediatric cardiology department owing to fatigue and grade 4/6 pansystolic murmur. He had a history of tonsillopharyngitis 2 weeks before admission, and fever and polyarthralgia ongoing for the past 2 days. He was lethargic and pale with tachypnoea (35 breaths/minute) and tachycardia (140 beats/minute). Grade 4/6 pansystolic murmur located at the left sternal border radiating to the left axilla and a loud second heart sound were heard. Gallop rhythm and jugular venous distension were present. He had rales over the lung bases and the liver was palpable 8 cm below the costal margin. Electrocardiogram revealed normal sinus rhythm with first-degree atrioventricular block. Chest radiography revealed pulmonary congestion and enlarged cardiac silhouette, with a cardiothoracic index of 0.60. Echocardiography revealed that cardiac chambers, being more prominent in left atrium and ventricle, were markedly dilated cardiac chambers were more prominent in the left atrium and left ventricle; left ventricular internal dimension in end-diastole was 42 mm (M-mode Z-score: 4.57) and left atrium:aorta ratio was 2.72. He had severe mitral regurgitation (pansystolic jet with a peak velocity of 6 m/second and a posterolateral jet fulfilling the left atria with a length of 38 mm), moderate aortic regurgitation (holodiastolic jet with a peak velocity of 5 m/second) causing diastolic retrograde flow in descending aorta, severe tricuspid regurgitation with a peak gradient of 55 mmHg, and mild pulmonary regurgitation (Supplementary video 1). Laboratory findings were as follows – white blood cell count: 9640/mm<sup>3</sup>, haemoglobin: 9.7 g/dl, haematocrit: 32.3%, thrombocyte count: 3,65,000/mm<sup>3</sup>, C-reactive protein: 7.3 mg/dl (<0.8), erythrocyte sedimentation rate: 62 mm/hour, anti-streptolysin O titre: 1726 IU/ml, and other biochemical laboratory findings were normal. He was hospitalised to the paediatric ICU for continuous monitoring with diagnosis of rheumatic heart disease and congestive heart failure. A single parenteral injection of benzathine benzylpenicillin; oral anti-congestive such as enalapril, furosemide, or spirinolactone; and methylprednisolone treatment was administered. On the 1st day of the treatment, wide QRS tachycardia with a heart rate of 190 beats/minute occurred (Fig 1). Lidocaine (1 mg/kg) was administered intravenously and the sinus rhythm was obtained. Lidocaine infusion was administered at a dose of 20 mcg/kg/minute, and then a single bolus of lidocaine was repeated and the infusion rate was increased to 30 mcg/kg/minute because of recurrent ventricular tachycardia. The 24-hour Holter electrocardiogram (ECG) monitoring



**Figure 1.** In all, 12 lead electrocardiogram of the patient showing wide QRS tachycardia with a heart rate of 190 beats/minute.

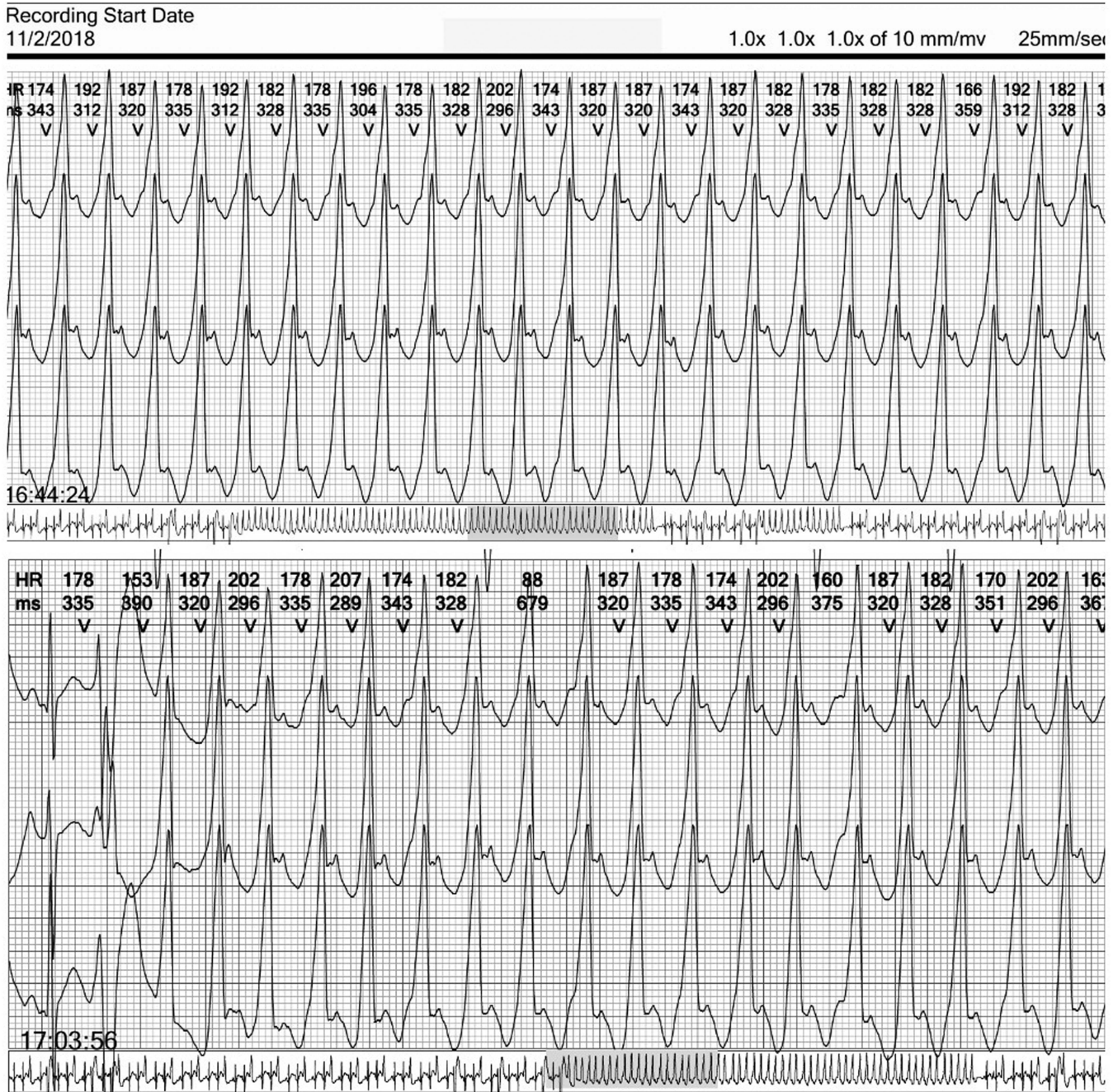
performed on the 1st day revealed 20,963 ventricular ectopy beats and 228 ventricular runs, mostly sustained ventricular tachycardia episodes with a rate of 190–200 beats/minute (Fig 2), in the first 6 hours of the treatment, which subsided markedly after lidocaine infusion and disappeared completely after 12 hours of treatment (Fig 2). At the 24th hour of lidocaine infusion, oral propranolol treatment with a dose of 3 mg/kg/day was started and lidocaine infusion was ceased with decreasing doses in 6 hours after oral propranolol treatment. The 24-hour Holter ECG monitoring performed on the 4th day of anti-arrhythmic treatment revealed 54 ventricular ectopy beats with one ventricular pair. Oral propranolol was continued for 2 months along with the anti-inflammatory treatment. At the 3rd month of follow-up just with enalapril treatment and penicillin prophylaxis, the patient had mild to moderate mitral and mild aortic regurgitation, and no significant regurgitation of tricuspid and pulmonary valves. The 24-hour Holter ECG monitoring was normal.

## Discussion

Acute rheumatic fever is still the most common acquired heart disease, and one of the most important causes of cardiovascular morbidity and mortality in developing and underdeveloped

countries. Incidence of the disease in these countries still reaches epidemic levels. The diagnosis is made according to the Jones criteria, which were revised in 2015.<sup>1</sup> The most common presentations of the acute disease are arthritis and carditis. Cardiac involvement in acute rheumatic fever may present as pancarditis affecting the pericardium, myocardium, and the endocardium, and may present with valvulitis, cardiomegaly, pericarditis, or congestive heart failure.<sup>2</sup> Although first-degree atrioventricular block is the most commonly (40%) observed conduction problem – also one of the minor criteria of acute rheumatic fever – higher degrees of atrioventricular block and junctional tachycardias are also frequent in acute stages of acute rheumatic fever.<sup>2–4</sup> Very rarely complete atrioventricular block and ventricular/supraventricular tachycardias have also been reported.<sup>2</sup> The incidence of advanced atrioventricular block was reported as 1.6% and second–third degree atrioventricular block as 6.1% in different studies.<sup>5</sup> To the best of our knowledge, ventricular tachycardia is an exceptionally rare rhythm disturbance manifested during acute rheumatic fever, and up to date only two cases have been reported.<sup>4</sup> Most rhythm problems are independent of valvular involvement, and although the exact cause is unknown they are thought to be due to inflammation of the myocardium and myocardial oedema. Most are temporary and self-limited to the acute stages of the disease and resolve





**Figure 2.** The 24-hour Holter ECG monitoring showing episodes of ventricular tachycardia with a heart rate of  $\geq 190$  beats/minute.

completely with anti-inflammatory treatment without any clinical significance.<sup>3</sup> In our country, acute rheumatic fever is still a major problem. Our case was admitted with findings of overt congestive heart failure. Despite the fact that severe endocarditis involved four valves, ventricular tachycardia was observed during the 1st day of hospitalisation. Although most rhythm disturbances observed during acute rheumatic fever resolve with anti-inflammatory medication, anti-arrhythmic medication was administered to our patient along with multi-drug medical therapy for congestive heart failure because the patient had overt congestive heart failure with severe valve insufficiencies and was haemodynamically compromised. Lidocaine infusion was

replaced with oral propranolol at the 24th hour of treatment, and the oral propranolol therapy was continued for 2 months and no other rhythm disturbances have been observed since.

### Conclusion

Various types of rhythm disturbances may develop in the acute stages of rheumatic fever, and very rarely complete atrioventricular block and ventricular tachycardias may be observed. Thus, the patients should be closely monitored for rhythm disturbances in the acute stages of the disease, and if possible

24-hour Holter ECG monitoring should be performed in acute stages of the disease to detect intermittent rhythm disturbances.

**Supplementary material.** To view supplementary material for this article, please visit <https://doi.org/10.1017/S1047951118001518>

**Acknowledgements.** None.

**Financial Support.** This research received no specific grant from any funding agency or from commercial or not-for-profit sectors.

**Conflicts of Interest.** None.

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