A 14-year-old boy was referred to our institution for evaluation of heart failure potentially related to a tachycardia-induced cardiomyopathy. The condition was first diagnosed at the age of 7 years, because of frequent palpitations. Echocardiography excluded a congenital heart disease and the ejection fraction (EF) was 68% at this time, whereas Holter-electrocardiographic monitoring demonstrated incessant paroxysmal focal atrial tachycardia (FAT) (Fig. 1A). Various antiarrhythmic drugs were started, without any effect (verapamil, digoxin, propanolol, amiodarone). At the age of 13 years, the patient’s functional status had gradually worsened to reach stage 3 of the New York Heart Association. Echocardiography revealed altered left ventricular function (EF 35%) and significant dilation of the left ventricle, without any evidence for coronary disease or specific cause of cardiomyopathy.

After discussion with his parents about the risk/benefit ratio of the procedure, it was decided to carry out ablation. The morphology of the ectopic P wave showed negativity in aVL, discrete positivity in V1 and strong positivity in leads II, III and aVF, pointing to an origin in the right upper part of the left atrium. The left atrium was mapped using a trans-septal approach, confirming the origin of the left tachycardia at the ostium of the right superior pulmonary vein. A single radiofrequency application at the site of ectopy was immediately effective (Fig. 1B and C). Close follow-up confirmed complete recovery of left ventricular function (EF 35%) 6 weeks after ablation. After 4 years of follow-up to date, the patient remains asymptomatic and Holter monitoring remains unremarkable.

Tachycardia-induced cardiomyopathy is a rare and potentially treatable cause of heart failure that should be considered systematically in cases of idiopathic “dilated cardiomyopathy”. Radiofrequency ablation may be an efficient therapeutic approach when pharmacological therapy has failed to control the arrhythmia.
Figure 1. A. Electrocardiogram before ablation (paper speed 25 mm/s) showing constant runs of focal atrial tachycardia (FAT) with 1/1 atrio-ventricular conduction and a mean heart rate of 130 beats/min. B. Fluoroscopy, anteroposterior view of the successful ablation site. A Lasso catheter was placed at the ostium of the right superior pulmonary vein using the trans-septal approach. An ablation catheter was placed at the anterosuperior part of the right superior pulmonary vein ostium (arrow). C. The first radiofrequency application at this site resulted in interruption of FAT after a few seconds (paper speed 25 mm/s). Note the artefacts related to radiofrequency delivery.

Conflict of interest statement

None.