

EP CASE REPORT

Incessant tachycardia after successful ablation of an atriofascicular pathway

Sirish C. Srinath Patloori^{1*}, Anandaroop Lahiri¹, Suraj Kapa², David Chase¹, and John Roshan¹

¹Department of Cardiac Electrophysiology and Pacing, Christian Medical College, Vellore, India; and ²Division of Cardiovascular Diseases, Department of Medicine, Mayo Clinic, Rochester, MN, USA

* Corresponding author. Tel: +91-4162283572; fax: +91-4162282288. E-mail address: sirishchandrasrinath@gmail.com

Introduction

Atriofascicular pathways (AFPs) are uncommon right free wall accessory pathways with a long course inserting close to the distal right bundle branch near the moderator band. They exhibit decremental antegrade conduction and do not conduct retrogradely.¹ Atriofascicular pathways can mediate antidromic re-entrant tachycardia (ART) with a characteristic left bundle branch block (LBBB) morphology. Embryologically, this pathway is likely to be a duplication of the atrioventricular (AV) node and can exhibit automaticity.² In this re-

port, we describe a patient with symptomatic tachycardia due to abnormal automaticity arising from an AFP remnant despite successful radiofrequency ablation (RFA) of the pathway.

Case report

A 36-year-old man presented with recurrent episodes of sudden onset palpitations. Electrocardiogram (ECG) showed regular LBBB morphology tachycardia with a superior axis. Electrophysiology study (EPS) was done and ART mediated via AFP was diagnosed. The pathway was mapped to the lateral tricuspid annulus and successfully ablated.

Three months later, he complained of a recurrence of symptoms. His palpitations were slower but became persistent and more bothersome. Electrocardiogram showed a wide-complex tachycardia (WCT) similar to the prior ART, albeit much slower. A 24-h ambulatory ECG showed multiple single beats (37/126 beats ≈ 37%) and short salvos of LBBB tachycardia (1576 runs; longest comprising 2185 beats over 35 min). This arrhythmia competed with sinus rhythm at a rate varying between 90 and 150 b.p.m., occurred in short runs with warm up and cool down pattern—suggesting automaticity (Figure 1A). Electrophysiology study was performed again.

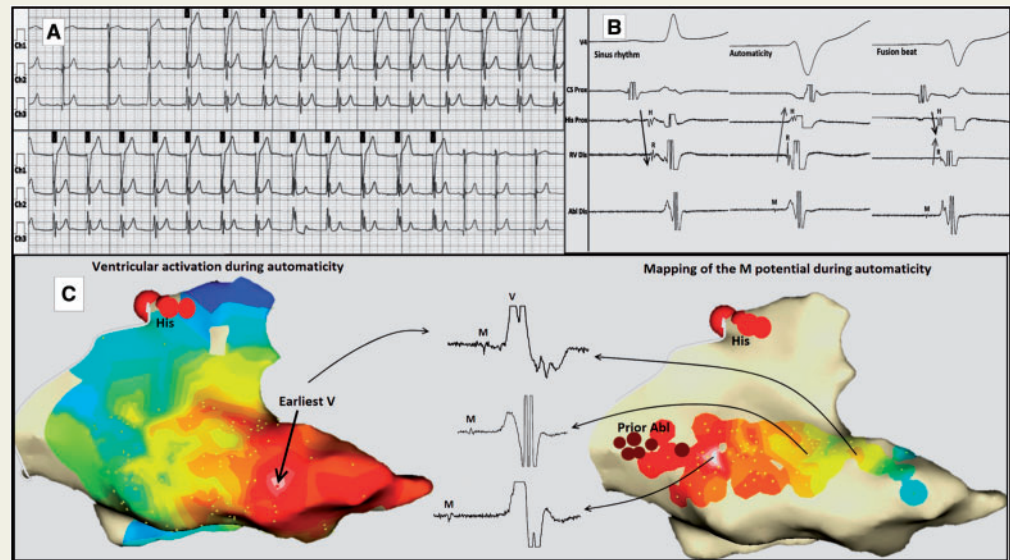


Figure 1 (A) Ambulatory electrocardiogram showing runs of wide-complex tachycardia competing with sinus rhythm. (B) Electrograms showing tachycardia beats and fusion beats. (C) Right ventricular activation and potential activation maps showing the earliest potential during tachycardia occurring at a basal location just distal to the prior ablation site.

During EPS, there was no evidence of the AFP. Short runs of the clinical WCT with AV dissociation and fusion complexes were seen (Figure 1B). During salvos of this tachycardia, the earliest ventricular activation was mapped to an area in the right ventricular (RV) free wall about two-thirds the distance between tricuspid annulus and the apex (≈ 40 mm from the tricuspid annulus and 20 mm from RV apex). A high-frequency potential was noted before the ventricular signal at this site. Careful mapping along the RV free wall during tachycardia showed the earliest potential in the basal RV free wall in an area just distal to prior ablation site (≈ 10 mm from annulus; Figure 1C). Radiofrequency lesions here terminated the tachycardia without recurrence.

Discussion

This patient presented with what appeared to be a ventricular arrhythmia after successful RFA of AFP. Nevertheless, the similarity to ART suggested a relation to the first arrhythmia. Electrophysiology study proved that the origin was in the basal RV free wall distal to the prior site of ablation of AFP in the tricuspid annulus. Automaticity from AFPs ('Mahaim automaticity') has been described either spontaneously or in response to RFA.² This is likely due to the presence of pacemaker cells in AFPs.³ This case illustrates a potential source of symptom recurrence after successful ablation of an AFP. While mapping, it is important not to ablate at the site of the earliest ventricular activation as this will merely cause the arrhythmia to exit from a different arborization of the AFP. The earliest potential that precedes the ventricular activation needs to be targeted. Here, it can be deduced that some of the cells with pacemaker properties in the AFP distal to earlier ablation site survived. After elimination of antegrade conduction through the AFP, these pacemaker cells were less accessible to overdrive suppression by the sinus rhythm facilitating the automaticity to manifest.

Conflict of interest: none declared.

References

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