Catheter Ablation of a Concealed Accessory Pathway Between the Right Atrial Appendage and the Right Ventricle

To the Editor:

Catheter ablation has become the treatment of choice for symptomatic patients with accessory pathways (acP) that connect the atria and the ventricles. For the most part, these connected both cardiac chambers at the level of the atrial-ventricular rings, although occasionally they are located at a certain distance from these, in unexpected places and generally unexplored.

We present the case of a 34-year-old male with no structural cardiopathy, referred for an electrophysiological study due to a history of several years’ evolution of paroxysmal supraventricular tachycardia. The baseline ECG was normal. The study was carried out with 3 tetrapolar catheters for the His region, the right ventricle and the right atrium. The existence of ventricular pre-excitation was excluded. Ventricular stimulation revealed ventricular-atrial (VA) conduction, eccentric and not decremental, with earlier atrial activity in the high right, which indicated a concealed right acP. A multielectrode “deflectable” catheter was placed in the right atrium, to aid in the cartography of activation of the tricuspid ring (TR) and to localised the atrial insertion of the acP with greater precision, and it was observed that the earlier atrial activation was registered in the TR lateral position (bipole 3-4).

In a highly reproducible manner, an orthodromic tachycardia was induced (Figure 1A), with a cycle length of 323 ms, a septal AV interval of 106 ms and in lateral TR of 83 ms, with an atrial activation sequence identical to that obtained in sinus rhythm with ventricular stimulation. The active participation of the right acP in the orthodromic tachycardia was confirmed with tachycardia stimulation manoeuvres. For the ablation, a “deflectable” tetra-polar catheter 7 Fr (Marin® 4 mm, Medtronic) was used, advancing...
through a preformed introducer (Fast-Cath SR3®, St. Jude Medical). During continued ventricular stimulation, 9 failed radio frequency applications were carried out (10-25 s; 60°; 55W) in the TR lateral position, where earliest results were obtained with respect to the earliest atriogram (TR 3-4), while never over 10 ms and without local AV continuity. Faced with these findings and the observation of great concomitance of atrial activation in the electrode pairs of the TR catheter,

we decided to map the right atrial appendage (Figure 2), in the baseline, precocities over 50 ms and local VA continuity were found, without observing any acP potential (Figure 1B). Five application were carried out in this region, the last of which (120 s; 50°; 30 W) managed to eliminate the acP conduction to 10 s permanently and without complications.

The acP with atrial insertion in the atrial appendage is due to epicardiac connections between this and the adjacent ventricle, whether congenital or

Figure 1. A: electrocardiographic derivations (II and V1) and intracavity registers of activation in the tricuspid ring (TR) (1-2 are the distal pair), His and right ventricle (RV) of the tachycardia. B: registers in the acP ablation point during continued stimulation from RV. ABL d, p: ablation catheter, pair of distal and proximal electrodes.

Figure 2. A: x-ray projection left anterior oblique (LAO) in the point of acP ablation. B: x-ray projection right anterior oblique (RAO) in the point of acP ablation. ABL, ablation catheter; TR, catheter for tricuspid ring mapping; RV, right ventricle catheter.
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surgically created.\(^1,2\) The norm is, as occurred in this case, the absence of an acP potential in the ablation exit point, due to the fact that these pathways are a consequence of a direct connection between the atrial appendage and the ventricular myocardium. Ablation from the right atrial appendage usually requires its isolation with the applications of the atrial appendage that joins the ventricle, which usually obliges to use numerous applications.\(^3\) It could be necessary on occasion to use irrigated tip catheters due to the limited blood flow in the interface between the catheter and the atrial appendage trabeculated surface, or an epicardial, surgical or percutaneous approach.\(^1,4\)

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REFERENCES


Electrocardiographic Diagnosis of Acute Coronary Syndrome in Patients With Endocavitary Pacemakers

To the Editor:

In the majority of patients with permanent pacemakers with endocavitary stimulation on the right ventricle, a left bundle branch block pattern on the surface electrocardiogram that makes it difficult to identify acute myocardial ischemia. Occasionally, the changes in the repolarisation of these stimulated complexes can reveal myocardial lesions in the context of an acute coronary syndrome, as described in these illustrative cases.

The first case is a 76-year-old woman with a history of hypertension, paroxysmal atrial fibrillation, moderate combined mitral valvulopathy, and endocavitary pacemaker (mode VVI) due to complete atrioventricular block. She was admitted to hospital presenting angina with elevated myocardial lesion markers (troponin I, 11.43 ng/mL). The ECG demonstrated a paced rhythm with stimulated complexes with left bundle branch block morphology and ST segment depression of 3 mm from V3 to V6 concordant with the QRS complex, with normalized after the angina symptoms creased with medical treatment (Figure 1). Clinical course was favourable with conservative management and there was no evidence of heart failure or arrhythmic episodes. The echocardiography displayed study demonstrated preserved systolic function and localized septal and anterior hypokinesia.

Case 2 is an 81-year-old female, with a history of dyslipidemia, hypertension, and endocavitary pacemaker (mode VDD) due to complete atrioventricular block. She was admitted to the emergency room with angina, nausea and profuse sweating; the surface ECG showed a pacemaker rhythm with atrial tracking and left bundle branch block morphology with ST segment elevation of 5 mm in leads V2, V3 and V4, not concordant with the QRS complex (Figure 2A). Urgent coronary arteriography disclosed atherothrombotic occlusion of the mid-proximal anterior descending artery and percutaneous coronary intervention was performed (angioplasty and bare metal stent deployment). Clinical course was favourable (tropinin I, 32.7 ng/mL), with normalisation of repolarisation in paced QRS complexes (Figure 2B). Ventriculography displays anterior hypokinesia, with mild systolic dysfunction.

In the GUSTO I study, Sgarbossa et al\(^1\) described the sensitivity and specificity of various ECG patterns to diagnose an acute coronary syndrome in the presence of right bundle branch block morphology, both native and induced by endocavitary pacing from the right ventricle,\(^2\) as well as the increased risk that these represent for those suffering the episode. In the ECG with right endocavitary pacing, both ST segment depression >1 mm in precordial leads with concordant QRS complex polarity, and ST segment elevation >5 mm with opposite QRS complex polarity presented low sensitivity for diagnosis (25% and 31%, respectively). However, specificity is very high (96% and 92%), so this finding