Clinical Case Reports

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CASE REPORT

A recurrent concealed parahisian accessory pathway

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Funding Information
No sources of funding were declared for this study.

Received: 19 December 2017; Revised: 3 March 2018; Accepted: 24 March 2018

Clinical Case Reports **2018; 6(6): 1101–1105**

doi: 10.1002/ccr3.1538

Key Clinical Message

This case demonstrates the interest of ablating in the aortic root in case of resistant parahisian accessory pathways with failure of the right side approach. Failure on the right side may be due to fear of creating an AV block of failure to ablate critical fibers in the parahisian position.

Keywords

Aortic root ablation, parahisian accessory pathway.

Case Report

A 25-year-old man presented with episodes of recurring tachycardia since 4 years. The episodes recurred up to five times per month, lasted up to 30 min, and were accompanied by dizziness. The patient is a professional boxer.

The surface electrocardiogram showed an incomplete right bundle branch block with a QRS width of 100 msec. The echocardiogram was normal. Blood tests showed normal electrolytes with K at the lower side of normal at 3.5 mEq/L.

No tracing of the tachycardia was available.

He underwent a first EP study in 2014. Parahisian pacing was compatible with the presence of an accessory pathway (Fig. 1). A supraventricular tachycardia at a rate between 200 and 230 bpm was inducible, and the presence of an accessory pathway as the retrograde limb of the tachycardia was confirmed by showing advancement of the atrial activation by delivering ventricular extrastimuli during the tachycardia at a time the His was refractory (Fig. 2). Mapping during tachycardia demonstrated a parahisian concealed accessory pathway with a QRS-A interval of 80 msec, in the vicinity of the His recording area. Cryoenergy was applied and stopped the tachycardia after a couple of seconds at minus 30°C. A full 4-min cryoablation application at −80°C was applied. The His amplitude recorded at the ablation site after termination of the tachycardia was 72 μV. After a 30-min waiting period, no signs of the presence of the accessory pathway were present, and only a physiologic retrograde nodal conduction was present during ventricular pacing.

The tachycardia recurred shortly thereafter with no improvement at all.

A second procedure was performed in 2016. The location was confirmed, and cryoenergy was again used during ongoing tachycardia at 330 msec BCL. The QRS-A interval at the optimal site was 60 msec, and the V/A ratio was 10 (Fig. 3). The retrograde A at the ablation site preceded the earliest (proximal) coronary sinus site by 45 msec. The tachycardia stopped as soon as −30°C was reached, and a His amplitude of 96 μV could be recorded at the ablation site (Fig. 3).

After a 1-h waiting period, ventricular pacing only showed a physiological retrograde conduction.

The tachycardia recurred shortly thereafter, unchanged.

A third EP study was performed in 2017. Based on the previous findings, we decided to explore the aortic coronary cusps before mapping the right side again (Fig. 4). During tachycardia, a very short QRS-A interval was

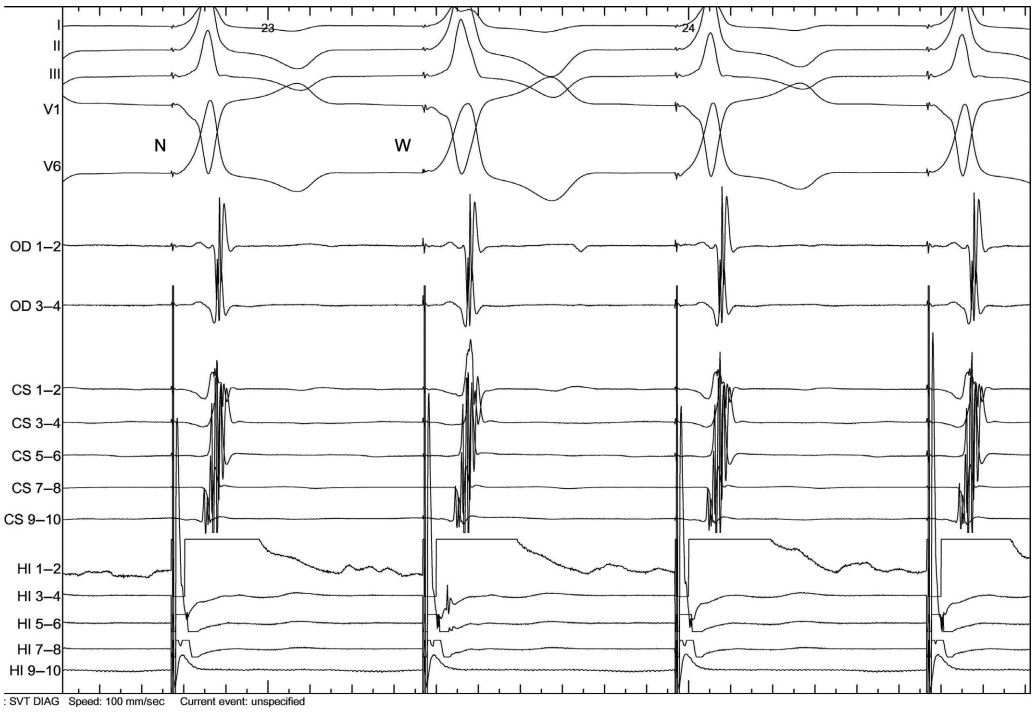

Figure 1. Parahissian pacing before ablation. Retrograde atrial activation is concentric. Both the timing, the morphology, and the V-A interval are unchanged whether there is His capture (N, narrow QRS) or not (W, wide QRS). This demonstrates that the concentric retrograde conduction seen proceeds via an accessory pathway and not via the physiologic nodal conduction system.

Figure 2. Right ventricular septal base pacing demonstrating that the atrial activity can be advanced at a time the His is refractory. It is a very late coupled ventricular paced beat that is so late that it does not modify the morphology of the native QRS complex. This is because it is delivered very close to the accessory bypass tract ventricular insertion. Despite this, there is a clear-cut advancement of the atrial activity (310 = >285 msec A-A interval).

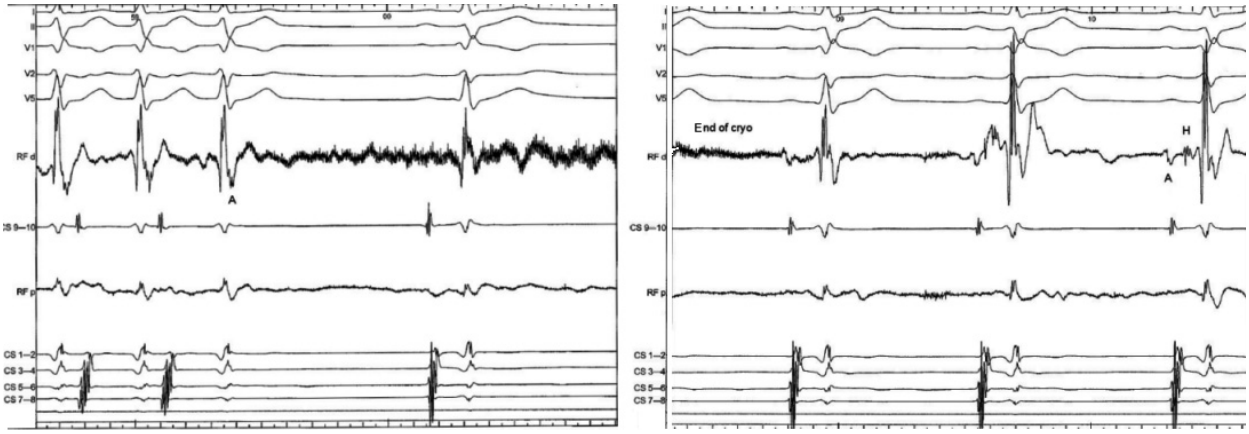

Figure 3. During orthodromic tachycardia, the QRS-A is very short, and there are V and A fusion. This is an optimal ablation site. As soon as cryoenergy is started (noise on the baseline), the tachycardia stops with V-A block. CS 1-2 is distal. After rewarming (end of cryo), a His activity can be seen on the ablation catheter (H).

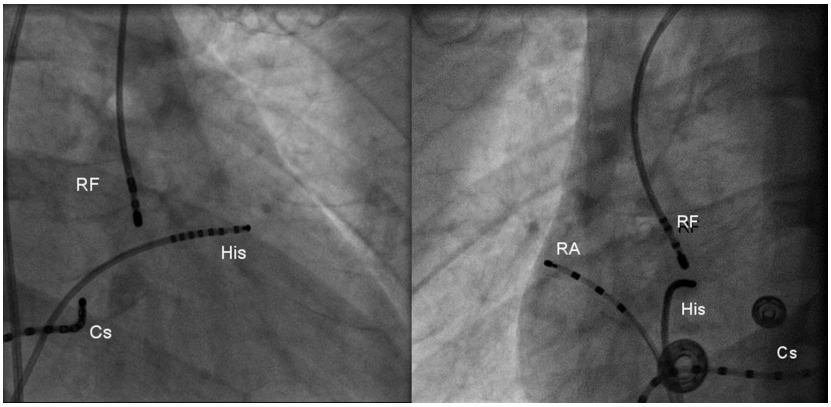

Figure 4. RAO and LAO views of the catheters showing the proximity between the ablation catheter placed in the aortic root (RF) and the His catheter (H). High right atrial catheter (RA) and coronary sinus catheter (CS) can also be seen.

measured with a nonirrigated RF catheter placed inside the noncoronary cusp. At that site, the atrial activity was buried inside the ventricle and could not be seen but had to be <70 msec. It preceded the earliest CS activity by at least 45 msec. Thirty watts RF was applied, and the tachycardia was stopped with V-A block after 2.5 sec (Fig. 5). We delivered 35 W during 70 sec followed by a bonus application. After conversion to sinus rhythm, a clear-cut atrial potential could be recorded at the ablation site.

During a 50-min waiting period, no abnormal conduction could be seen. The disappearance of the abnormal retrograde conduction was demonstrated by showing a marked prolongation of the retrograde conduction with a decremental behavior (Fig. 6), retrograde block during ventricular pacing and adenosine injection (Fig. 7), and noninducibility of the tachycardia.

Since this third intervention the patient has been asymptomatic. The follow-up amounts to 6 months. PR interval was normal before the ablations and remained unchanged.

Conclusions

This case illustrates the interest of exploring the coronary cusps in case of resistant parahisian accessory pathways, in this case, although a satisfactory result was obtained during two consecutive ablation sessions with cryoenergy delivered on the right side the pathway recurred.

Whether the pathway could have been ablated on the left side alone is unknown. Whether the pathway could have been ablated on the right side with radiofrequency energy, (albeit taking more risks with the native conduction), is also unknown [1–6].

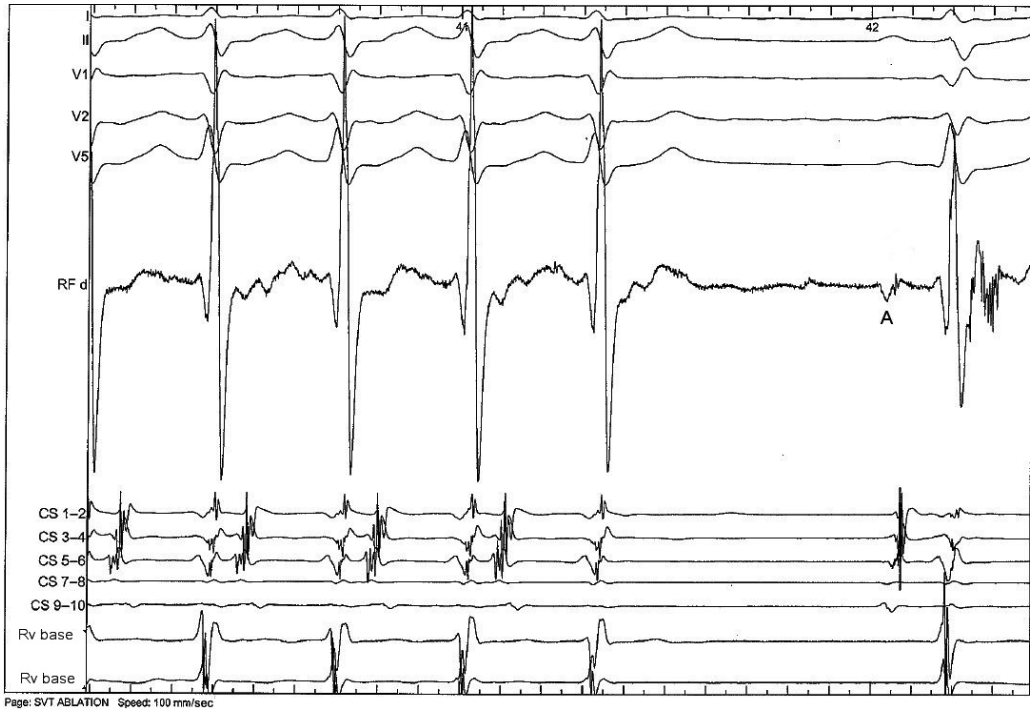

Figure 5. Ongoing tachycardia mapped from the noncoronary aortic cusp. The QRS-A has to be very short (<70 msec) because the A cannot be clearly seen because of its inclusion in the ventricular activity. A V-A block rapidly occurs with RF, and subsequently, a clear-cut atrial activity (A) can be seen during sinus rhythm on the ablation catheter.

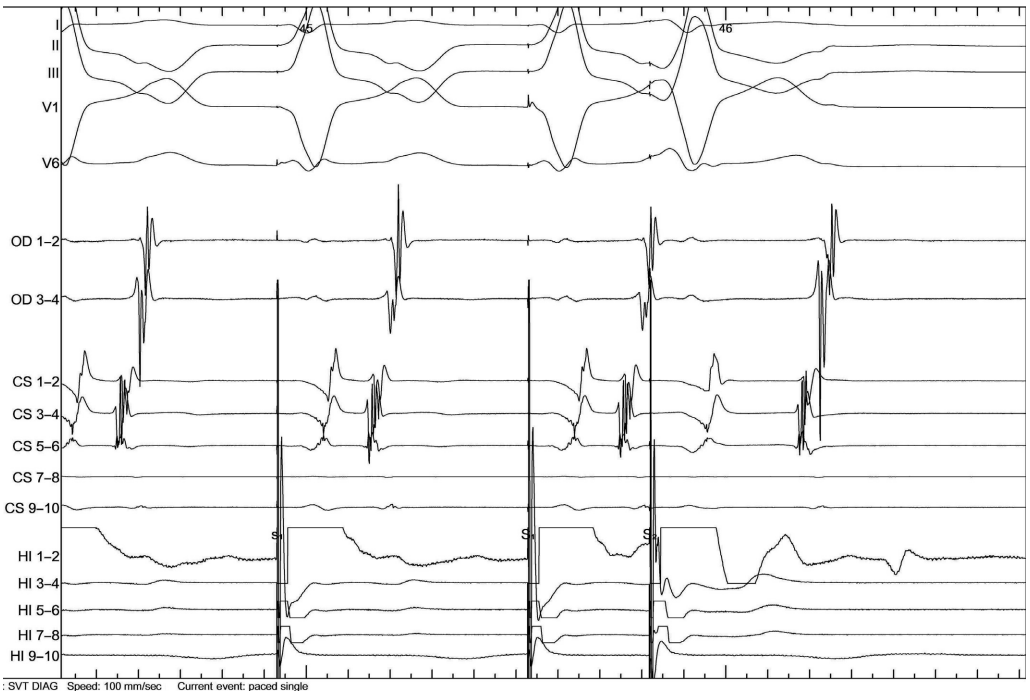

Figure 6. Ventricular pacing after accessory pathway ablation. It shows a markedly prolonged retrograde conduction time with decremental properties suggestive of an isolated nodal retrograde conduction.

Figure 7. Ventricular pacing after 12 mg adenosine injection at the end of the RF aorta root procedure showing V-A dissociation and high-to-low atrial activation (sinus).

Conflict of Interest

None declared.

Authorship

TV: was main senior electrophysiologist. JC: attend senior electrophysiologist. AA: attend junior electrophysiologist.

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