

Catheter inversion technique for ablation of parahisian accessory pathway

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A case of WPW Syndrome due to parahisian accessory pathway was ablated by the catheter inversion technique. The pathway could not be eliminated by direct femoral approach using repeated high radiofrequency energy ablation. No pathway potential was seen in the aortic cusps. Instead, it was successfully ablated by curving the ablation catheter underneath the septal leaflet of the tricuspid valve to gain direct contact with the pathway.

A 16-year-old male presented with palpitations and pre-excitation on the 12-lead ECG suggestive of a parahisian pathway. Electrophysiological study showed inducible orthodromic re-entry tachycardia. Non-irrigated 4 mm tip catheter supported with long sheath mapped

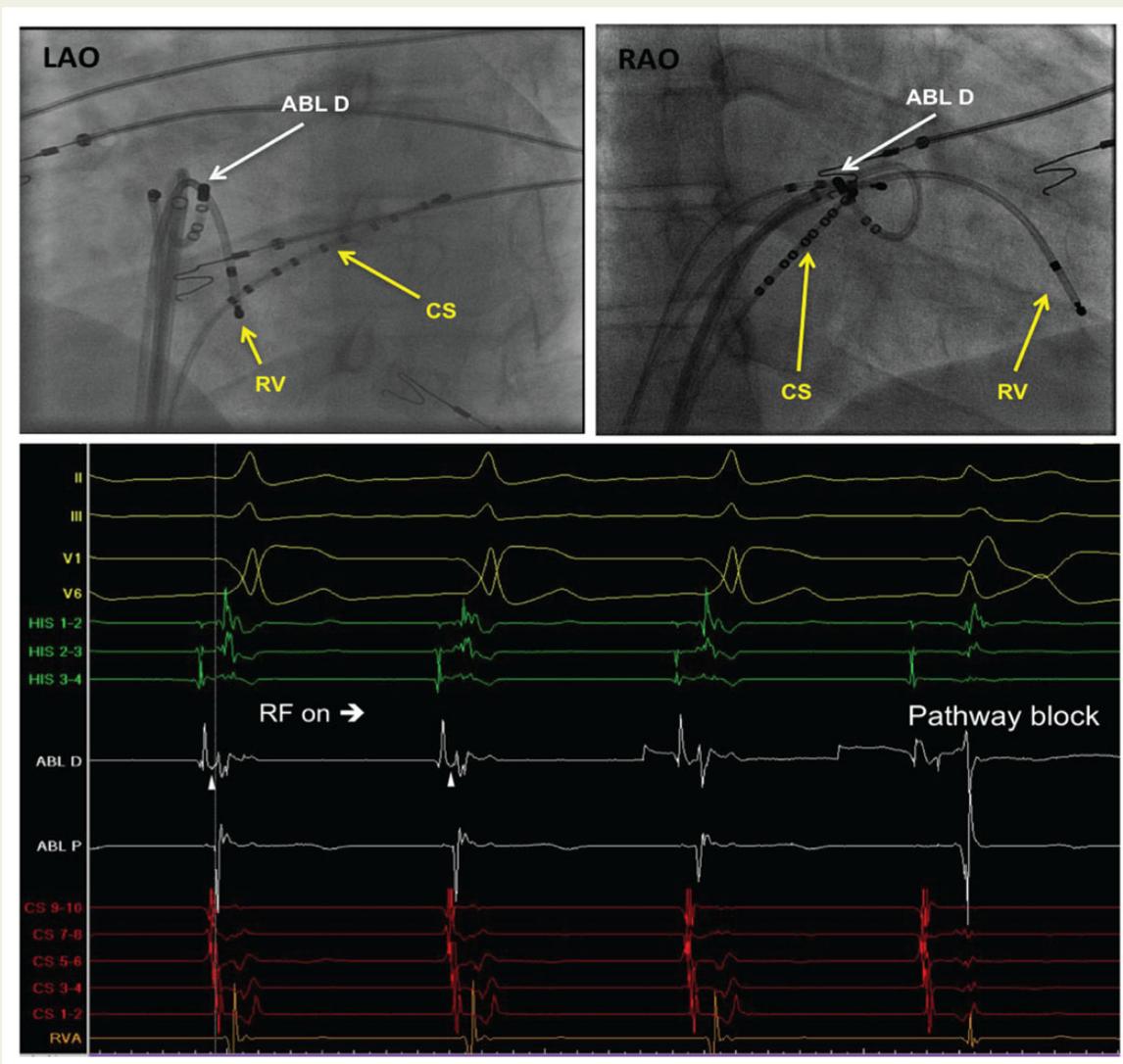


Figure 1 Catheter inversion technique. (Top panels) LAO and RAO projection of catheter position, ablation catheter (ABL D), coronary sinus (CS), right ventricle (RV), HIS during RF application. The ablation catheter tip (ABL D) was deflected in a parallel orientation to the septum under the hinge of the tricuspid valve. (Lower panel) Accessory pathway conduction with a small pathway potential (triangular pointer) was eliminated within 3 s of radiofrequency energy delivery.

the accessory pathway potential to the parahisian region and radiofrequency energy application resulted in rapid pathway block (see Supplementary material online, *Figure S1*). However, acute pathway conduction recurred several times despite up-titration of the power setting from 20 to 30 W using this direct femoral approach. At repeat procedure, aortic cusps were mapped but failed to identify any pathway potentials. At this point, the decision was made to invert the catheter orientation to map on the right side underneath the tricuspid valve. Contact block of the accessory pathway was observed without AV block at that site (see Supplementary material online, *Figure S2*), and therefore radiofrequency (20 W) was delivered empirically, without evidence of acute pathway reconduction.

However, pathway recurrence was noted with symptoms at follow-up. A second attempt of the catheter inversion technique was performed with an aim to deflect the catheter tip in an orientation parallel to the septum under the tricuspid valve hinge. One radiofrequency application at 20 W at the parahisian site with a small accessory pathway potential successfully eliminated pathway conduction within 3 s (*Figure 1*). No recurrence was observed after >1 year.

Discussion

Parahisian accessory pathways are generally superficial and can be successfully ablated using a direct approach in the great majority of cases with only rare complications.¹ Our case is unusual because even though it was superficially located on the endocardium, it could not be eliminated by a direct approach using repeated high-energy ablation. Instead, it was successfully ablated by curving the ablation catheter underneath the septal leaflet of the tricuspid valve and back towards the annulus to gain direct contact with the pathway.

A similar technique has also been described for successful ablation of left ventricular outflow tract tachycardia and anteroseptal accessory pathway under the aortic cusps.^{2,3} A recognized alternative technique is the superior approach via a jugular or subclavian vein, but our method from inferior route with the catheter inversion technique allowed direct access underneath the tricuspid valve, better control of the orientation of the catheter tip to avoid contact pathway block in the last procedure and avoided the risk of pneumothorax in a young patient.

In this report we wish to show that the success of the ablation is not only dependant on the stability of the ablation catheter, but also that the proximity of the ablation catheter to the accessory pathway plays an important role. We hypothesize that with the catheter inversion technique, we were in closer proximity to the accessory pathway as evident by selective contact pathway block. At the last ablation procedure with the catheter inversion technique, it was possible to achieve deflection of the tip to a parallel orientation to the septum under the hinge of the tricuspid valve, in a way that would be challenging to achieve for a cryoablation catheter, to avoid repeated contact pathway block. This allowed electrogram monitoring of pathway elimination by lower RF energy without the need to resort to higher power delivery.

Supplementary material

Supplementary material is available at *Europace* online.

Conflict of interest: none declared.

References

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