

Posteroseptal Accessory Pathways Ablation: Do not forget the Coronary Sinus Diverticulum

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Abstract

The posteroseptal accessory pathways often are associated with coronary sinus abnormalities. We report the case of a 15-year-old female, who had palpitations due to Wolff Parkinson White Syndrome and high risk posteroseptal accessory pathway associated with coronary sinus diverticulum. The accessory pathway was successfully ablated using radiofrequency catheter ablation into the diverticulum. These accessory pathways have a very short refractory period and are associated with a risk of sudden cardiac death during atrial fibrillation. Performing a coronary sinus venography and demonstrate diverticulum before ablation, substantially reduces failed ablation.

Keywords: accessory pathway; atrial fibrillation; radiofrequency ablation; wolff parkinson white syndrome.

Introduction

Posteroseptal accessory pathway is mostly associated with coronary sinus diverticulum. It opens by way of the neck either directly into the coronary sinus or into a tributary. The accessory atrioventricular connections associated with venous diverticulum are epicardial musculature remnants of the sinus venosus. [1] These accessory pathways have very fast conduction properties associated with the high risk of sudden cardiac death. [2] We report the case of a 15-year-old female who suffered from

palpitation due to Wolff Parkinson White Syndrome with multiple coronary sinus diverticulum and went to catheter ablation of high risk posteroseptal accessory pathway in one of these diverticulum.

Case presentation

A 15-year-old female with palpitations associated with delta wave on the Surface electrocardiogram consistent with a right side posteroseptal accessory pathway localization (**Figure.1**).

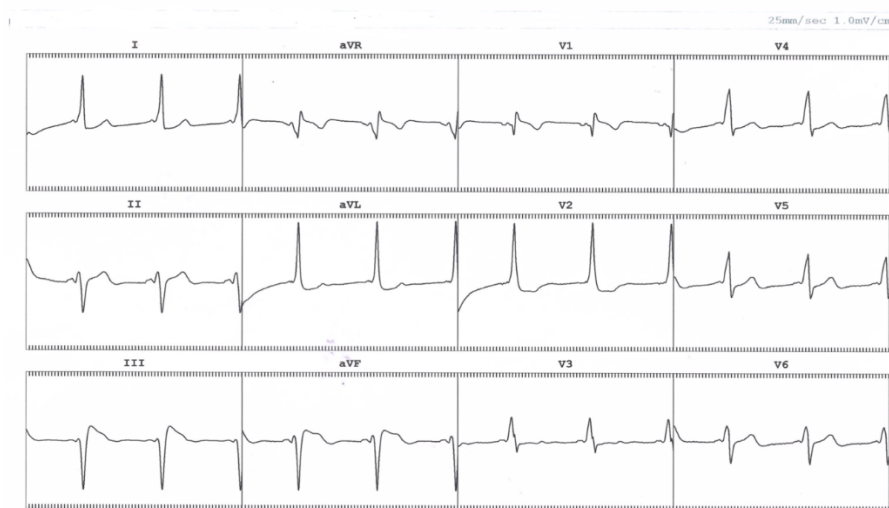


Figure 1: Twelve-lead electrocardiogram before a radiofrequency catheter ablation. Showing V1 isobiphasic, positive DI, and in inferior bipolar leads negative delta wave.

Physical examination and echocardiography disclosed no abnormalities. The treadmill exercise test showed that the maximal heart rate reached 175 bpm, but the delta wave did not disappear. She was referred for an electrophysiological study and radiofrequency catheter ablation under transvenous anesthesia. Three quadripolar catheters were inserted for recording signals from the high right atrium, the right ventricle and the bundle area. Also, a decapolar catheter was arranged in the coronary sinus. During ventricular pacing, the earliest atrial activation was at coronary sinus proximal (figure. 2) and decremental property was not shown. Pre-excited atrial fibrillation with high ventricular rate (figure.3) was induced by atrial and ventricular stimulation up to 270 milliseconds unable to reveal the antegrade and retrograde accessory pathway effective

refractory period. Mapping was performed on the right side over tricuspid valve and continuous atrioventricular conduction with accessory pathway was get into the proximal coronary sinus. Before ablation, a coronary sinus angiography was performed with long steerable sheath (figure. 4) and demonstrated multiple diverticulum coronary sinus into the middle cardiac vein and showed association with atrioventricular fusion and one of these diverticulum (figure. 5). The delta wave disappeared and the accessory pathway conduction was interrupted at 5 seconds after initiation of ablation using an irrigated-tip ablation catheter (therma control, 30 Watts at 42 °C up 120 ohm) (figure. 6). After radio frequency application, there was no accessory pathway.

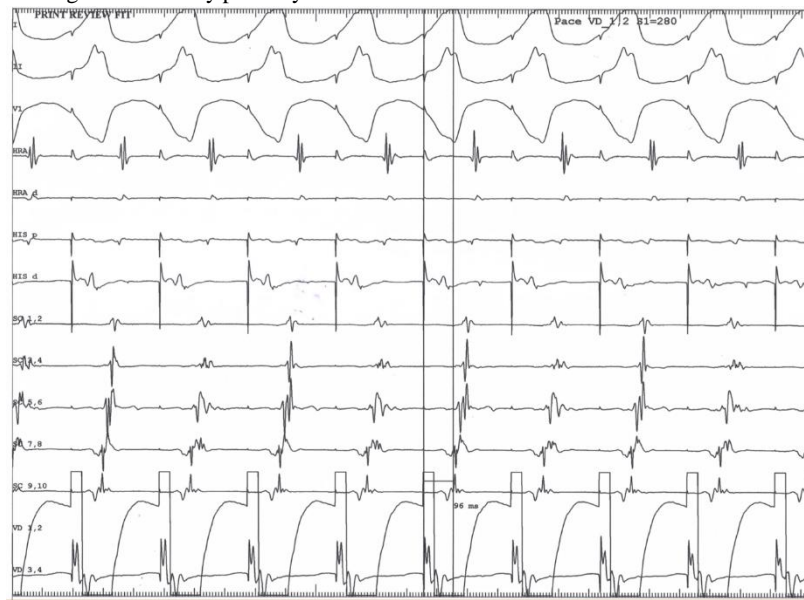


Figure 2: Intracardiac recording, showed high atrium, His area, coronary sinus and right ventricle electrograms. Right ventricle stimulation and no decremental ventricle-atrial conduction. Concentric atrial activation with earliest proximal coronary sinus electrogram. At the top V1, DII and DI electrocardiogram leads.



Figure 3: Pre-excited atrial fibrillation and very rapid ventricular response. Showing R-R intervals less than 250 milliseconds.

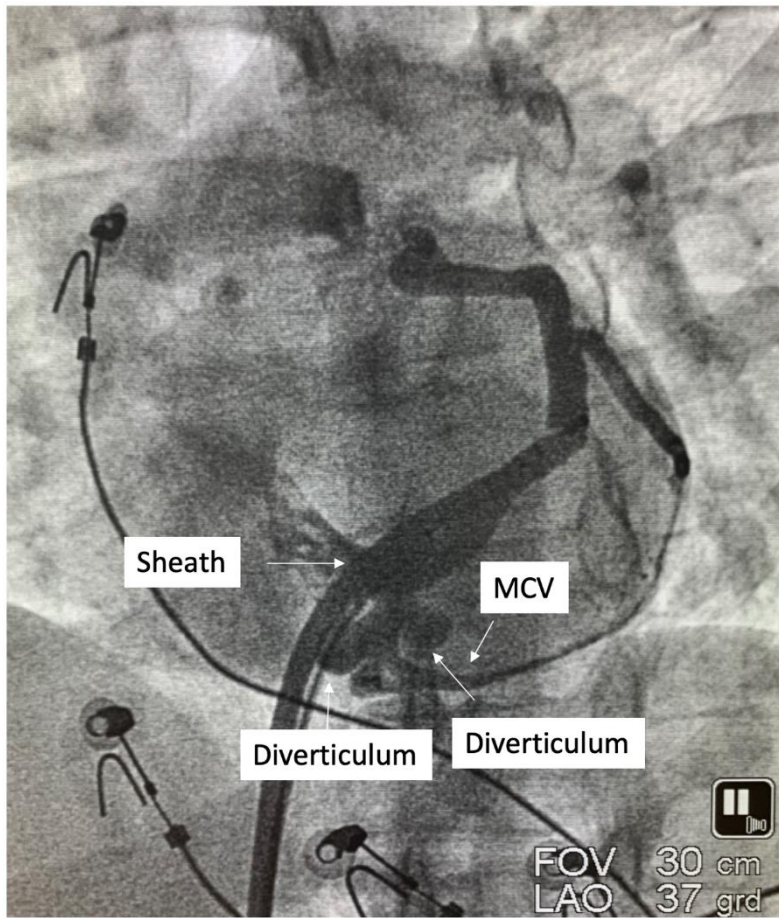


Figure 4: Left anterior oblique coronary sinus angiography, showing multiple diverticulum.

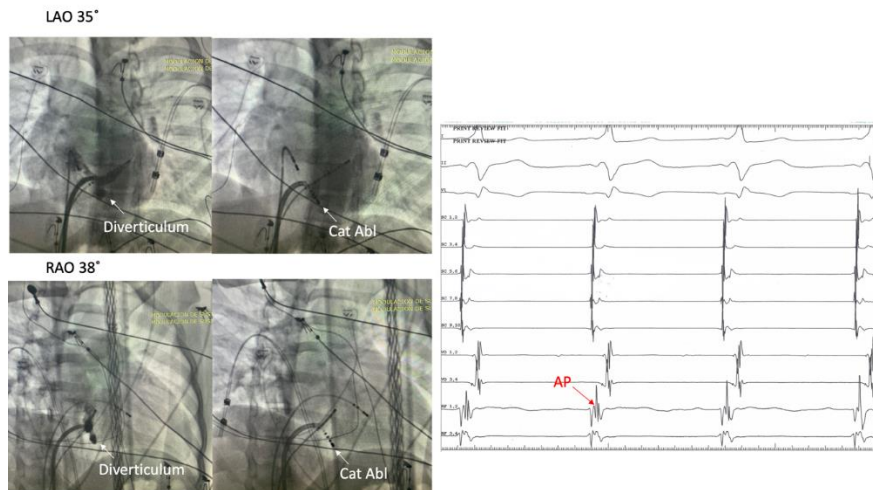


Figure 5: Right and left anterior oblique coronary sinus ostium angiography, showing one of multiple diverticulum and catheter ablation into the diverticulum. Intracardiac electrogram showed typical atrioventricular fusion accompanied with accessory pathway potential at ablation catheter. The position of ablation catheter is at the site of successful ablation.

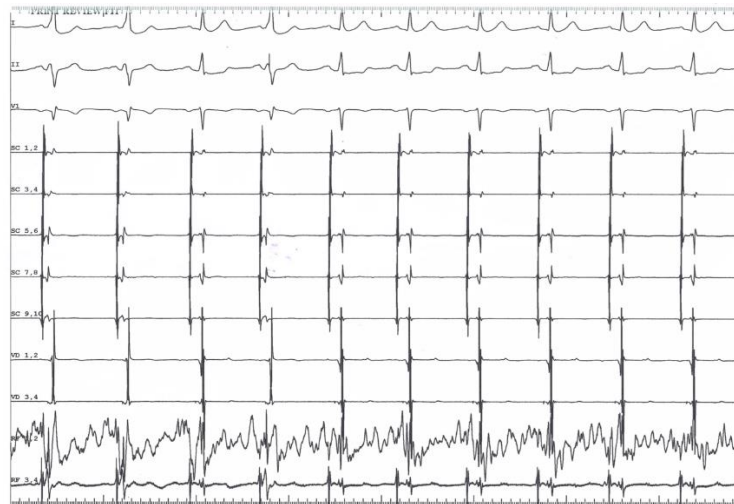


Figure 6: Delta wave and atrioventricular fusion was interrupted with early radiofrequency application.

Discussion

Although most patients with posterior accessory pathway occurs without a coronary sinus diverticulum, the incidence reported in series varying widely. In a series published by Sun et al. 7.5% of patients with posterior accessory pathway retrograde coronary sinus angiography demonstrated a diverticulum. In this largest series, 47% of patients had a previous failed ablation procedure and the accessory pathway was related to the coronary sinus diverticulum in 34/36 patients with diverticulum.³ Also, it has been reported an acute success rate of 75% for ablation procedure into the diverticulum.² In case of posteroseptal accessory pathway, the abolition of the pathway might be achieved infrequently from the endocardial site of posteroseptal space. In these cases, a coronary sinus contrast angiography which is a safe procedure may be helpful.

Conclusion

Our findings stress the utility for coronary sinus angiography when catheter mapping indicates a localization of posteroseptal accessory pathway. The angiography provides a considerable chance of identifying

a coronary sinus diverticulum and increase the success rate of the ablation catheter.

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