



Macro-Reentrant Atrial Tachycardia Involving the Coronary Sinus and Posterior Left Atrium: A Case Report

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Abstract

The re-entry between the coronary sinus and atrium is rare. The musculature of the Coronary Sinus (CS) has been implicated in a variety of arrhythmias, including macro-re-entrant atrial tachycardias. Therefore, when a hint of the CS potential associated with the posterior atrial wall is found, we do spare no effort to find the fact. Macro-reentrant atrial tachycardia involving the coronary sinus and posterior left atrium are extremely rare entities in clinical practice. We report a case of that.

Case Presentation

A 66-year-old man presented with palpitation whose electrocardiogram indicated Atrial Fibrillation (AF). He was given catheter ablation but AF continued. Then external direct current cardioversion turned AF into sinus rhythm. The roof line was not blocked at that moment so we continued ablation to block the roof line. Atrial flutter occurred during stimulation and induction

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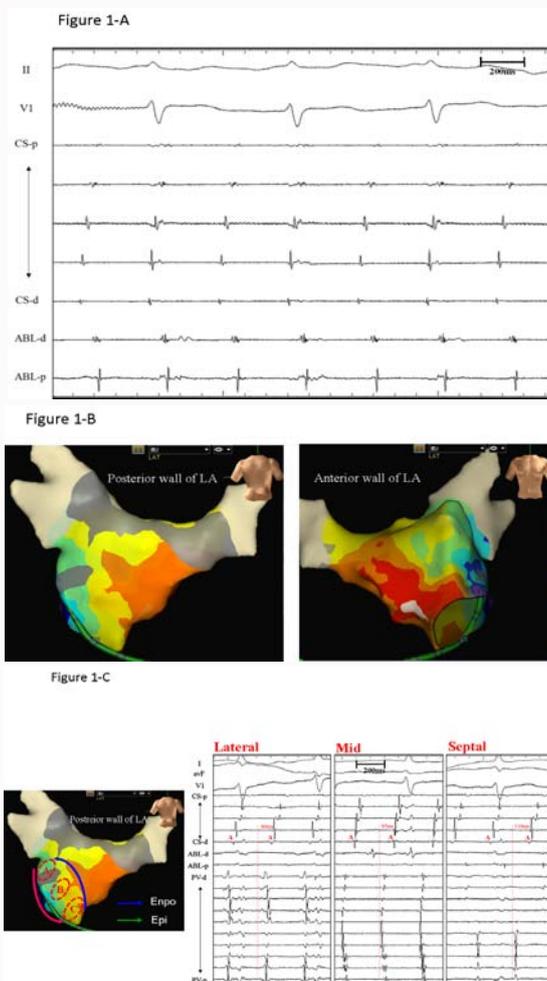


Figure 1: The potential of the posterior wall of the left atrium conducted from the septum of the atrium to the free wall, and the potential conduction of the anterior wall of the left atrium was the same as the posterior wall.

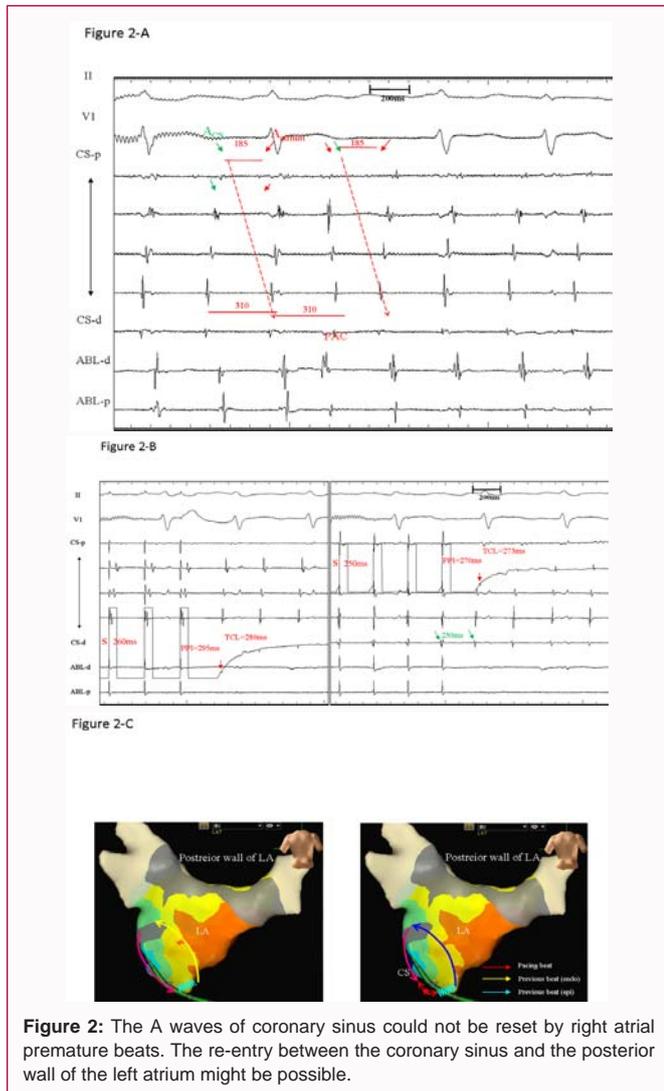


Figure 2: The A waves of coronary sinus could not be reset by right atrial premature beats. The re-entry between the coronary sinus and the posterior wall of the left atrium might be possible.

of AF, and the Tachycardia Cycle Length (TCL) was 250 ms. The second excitation mapping of endocardial surface was performed, indicating that the potential of the posterior wall of the left atrium conducted from the atrial septum to the free wall, and the potential conduction of the anterior wall of the left atrium was the same as the posterior wall (Figure 1A-1C). The atrial septum of the right atrium excited earlier, but the A waves of CS could not be reset by right atrial premature beats (Figure 2A, 2B), which suggested that the potential of the origin might come from the septum of atrium. Although the excitation mapping indicated that the septum of the left atrium locally excited earlier, the ablation was in vain. Thus the re-entry between the CS and the posterior wall of the left atrium might be possible (Figure 2C). The septum of the left atrium was locally ablated later, and the TCL extended to 330 ms. Further ablation couldn't prolong the TCL any more. Local fragmented potential was found by excitation mapping of the CS ostium (Figure 3A), the TCL extended to 350 ms after ablation, and then the tachycardia was terminated (Figure 3B). What is the most likely mechanism of this tachycardia?

Hospital course

Atrial tachycardia after the ablation of atrial flutter or fibrillation is common, but the re-entry between the CS and atrium is rare. Therefore, when a hint of the coronary sinus potential associated

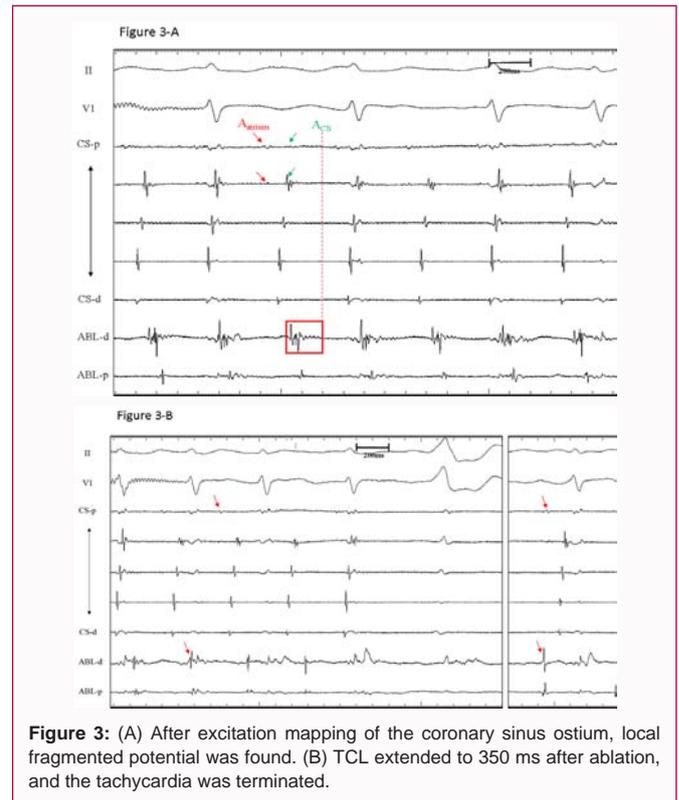


Figure 3: (A) After excitation mapping of the coronary sinus ostium, local fragmented potential was found. (B) TCL extended to 350 ms after ablation, and the tachycardia was terminated.

with the posterior atrial wall is found, we do spare no effort to find the connection between the coronary sinus potential and atrial tachycardia.

Discussion

Most scholars consider that atrial arrhythmia after AF ablation is associated with the recovery of pulmonary vein point conduction [1,2]. Re-entry is very common during electrophysiological examination, but the re-entry between the coronary sinus and atrium is rare. The abnormal phenomenon was found during pace mapping, that is the anterior and posterior atrial wall were excited with the same sequence from the septum to the free wall (Figure 1C), which brought obstacle for further diagnosis and treatment. The venous wall of the CS is surrounded by a continuous muscle cuff, which is not continuous along its long axis with the left atrial myocardium. The left atrial myocardium and the CS muscle cuff are separated by adipose tissue tapering away from the ostium and traversed by striated muscle fibers [3]. Observing the CS excitation sequence, a coronary sinus potential associated with posterior atrial wall could be found (Figure 2A), which indicated the re-entry between coronary sinus and posterior atrial wall, and confirmed that the position is located at the posterior septum (Figure 2C). After ablation at this site, the atrial tachycardia disappeared, and the CS special potential disappeared as well (Figure 3B). The existence of the CS potential was considered as the mechanism of this tachycardia. Based on the above findings, the most likely mechanism is the re-entry located between the CS and left atrium (Figure 3A). The musculature of the CS has been implicated in a variety of arrhythmias, including macro-re-entrant atrial tachycardias. The musculature of the CS serves as a critical component of the re-entry circuit in approximately 25% of the patients with atypical flutter after AF ablation [4]. Therefore, when a hint of the CS potential associated with the posterior atrial wall is found, we do spare no effort to find the connection between

the coronary sinus potential and atrial tachycardia. The PAC is very important. Atrial tachycardia after the ablation of atrial flutter or fibrillation is common, and sometimes the musculature of the Coronary Sinus (CS) is implicated [4]. In this case, the re-entry located between the coronary sinus and the left atrium was found.

References

1. Ouyang F, Antz M, Lober F. Recovered pulmonary vein conduction as a dominant factor for recurrent atrial tachyarrhythmias after complete circular isolation of the pulmonary veins: Lessons from double lasso technique. *Circulation*. 2005;111:127-35.
2. Jais P, Hocini M, Sanders P. Long-term evaluation of atrial fibrillation ablation guided by noninducibility. *Heart Rhythm*. 2006;3(2):140-5.
3. Michel C, Dipen C, Michel H. The Anatomic basis of connections between the coronary sinus musculature and the left atrium in humans. *Circulation*. 2000;101:647-52.
4. Aman C, Hakan O; FACC. Catheter ablation of atypical atrial flutter and atrial tachycardia within the coronary sinus after left atrial ablation for atrial fibrillation. *J Am Coll Cardiol*. 2005;46:83-91.