Merging three-dimensional CT with electroanatomical mapping facilitates mapping and ablation of ventricular arrhythmias originating from aortic root

Song Zou  
Ruikun Jia  
Kaijun Cui

Introduction: When radiofrequency ablation is performed in aortic root, angiography is traditionally recommended to avoid injury of coronary arteries. However, this strategy cannot real-time monitor distance from coronary ostia to catheter tip if catheter is moved and increases exposure to X-ray. To avert limitations mentioned above, we introduce an alternative approach to intuitively show special location of ablation catheter and coronary arteries by integrating three-dimensional CT (3D-CT) and electroanatomical mapping (EAM) in mutual-perpendicular planes (PA and LL views).

Methods: 12 patients (49.7±15.0 years old, 5 men) were prospectively recruited. Among them, ventricular arrhythmias (VAs) originated from left coronary cusp (LCC) in 9 patients, right coronary cusp (RCC) in 1 patient and junction between left and right coronary cusps (LCC-RCC) in 2 patients. Before mapping and ablation, we merged 3D-CT with EAM to monitor distance between coronary ostia and catheter tip.

Result: Ablation got acute success in all patients including 7 patients (5 LCC-originating cases and 2 LCC-RCC-originating cases) without coronary angiography and 5 patients (4 LCC-originating cases and 1 RCC-originating case) needing additional coronary angiography. No complication and technical difficulty occurred during operation.

Conclusion: Integration of 3D-CT and EAM facilitates mapping and ablation in aortic root, especially in LCC-originating and LCC-RCC-originating cases.