How to approach epicardial ventricular tachycardia: electroanatomical mapping and ablation by transpericardial nonsurgical approach

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In some patients with ventricular tachycardia, the arrhythmia may have an epicardial origin. In these cases, transpericardial non-surgical approach allows manipulation of a steerable catheter in the pericardial space to perform epicardial mapping and ablation. This report presents a case of a 53-year-old male patient with recurrent sustained monomorphic ventricular tachycardia (Fig. 1). He presented signs of cardiomyopathy, having mild impairment of systolic left ventricular function (ejection fraction 48%) and presence of late potentials on signal averaging electrocardiogram. Effort test and angiography excluded coronary artery disease. Prior antiarrhythmic drug therapy failed to prevent arrhythmia recurrences. An off-drug electrophysiological
study showed that the tachycardia could be reproducibly induced by programmed electrical stimulation, but no suitable site for ablation was found with endocardial mapping. Therefore, a transpericardial non-surgical approach under general anaesthesia was planned for epicardial mapping using an electroanatomical system (Carto®, Biosense-Webster, Baldwin Park, CA, U.S.A.). By sequential positioning of the mapping catheter on the epicardial surface of the ventricles, the epicardial activation was evaluated first in sinus rhythm and then during the clinical ventricular tachycardia. By combining conventional and non-conventional electrophysiological data, it was found that the arrhythmia was due to re-entry occurring in a very circumscribed epicardial area. Before ablation, the distance between the most suitable site, where stimulation resulted in concealed entrainment with a postpacing interval equalling the tachycardia cycle length, and the closest coronary artery branch, previously tagged during angiography, was measured on the electroanatomical map. A distance of 12 mm from the coronary artery was considered safe to deliver low power radiofrequency energy, which terminated the arrhythmia and rendered it non-inducible. No complication was observed and the patient has been free of symptoms for the following 24 months without medication. Thus, the use of a transpericardial non-surgical approach together with electroanatomical mapping can make a successful combination as well as a safe approach to epicardial ventricular tachycardias.

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